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Vol. 943 Number 3

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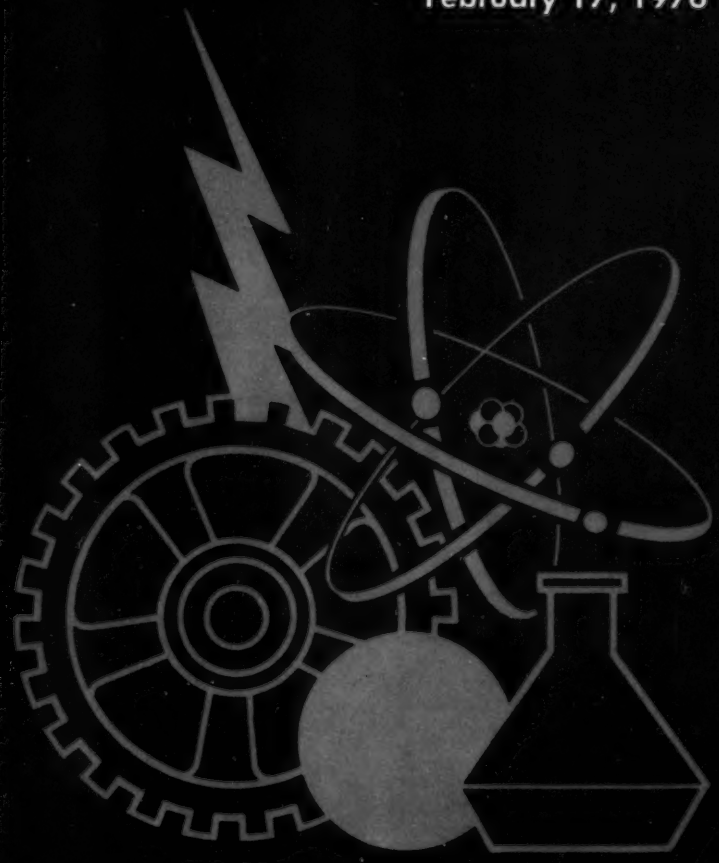
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

February 17, 1976



U.S.
DEPARTMENT
OF COMMERCE

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Trademark
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PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

February 17, 1976 Volume 943 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Second Trial Voluntary Protest Program

A Second Trial Voluntary Protest Program will be conducted during the coming months. It will be increased in scale and somewhat modified in procedure from the first such program. Announcement of and description of the rules for the first program appeared in 923 O.G. 2 on June 4, 1974.

As before, the objective is to gain experience in carrying out such a program and to determine the extent of interest by the public in participating and in supplying pertinent references. To the extent there is participation, the program should be beneficial by bringing new art to the attention of the Office, preventing inadvertent issuance of invalid patents, and increasing confidence in the strength of those patents which survive the protest proceedings.

The first Trial Voluntary Protest Program showed a considerable interest by applicants and the public in taking part in protest proceedings. A summary of the results will be published soon in this Gazette. The second Trial Voluntary Protest Program is designed to gain additional information as to public participation and also to follow more closely the procedures which would be required in a continuing, permanent protest program.

Applications Involved

In the second Trial Voluntary Protest Program, a Request to Participate and Waiver of Confidentiality form (PTOL–224 Temp.) will be sent to each applicant to whom a Notice of Allowance is mailed during a selected three week period, probably in October, 1975. The total number of requests mailed will be about 4,500. Applications for plant patents will be excluded from the program. The reason for this exclusion is the high cost of printing colored drawings and the relatively limited prior art available. No other applications will be excluded from the trial program, regardless of subject matter, type of application or earlier proceedings.

Waiver of Confidentiality

Two copies of the form letter requesting voluntary waiver of confidentiality (form PTOL–224 Temp.) will be mailed in the same envelope along with the Notice of Allowance. An additional copy of the form letter will be made of record in each application at the time of mailing. The applicant will have three months from the notice of allowance date in which to either (1) elect to participate in the Trial Voluntary Protest Program by filing a signed waiver of confidentiality, or (2) elect not to participate in the program by paying the issue fee. If he does neither, the application will become abandoned, as provided in 37 C.F.R. 1.316. The waiver of confidentiality is a part of form PTOL–224 Temp. This procedure will avoid any increase in pendency time for those applications in which an election is made not to participate in the program. An early filing of a waiver of confidentiality by the applicant will result in early publication of the application.

Publication

If the applicant decides not to participate in the protest program and payment of the issue fee is timely made, the patent will issue routinely without delay.

If the applicant elects to participate in the protest program and a signed waiver of confidentiality is filed in the Office within 3 months of the notice of allowance date, the Notice of Allowance will be vacated. In such a case the issue fee should not be filed, as it will not be accepted and applied if filed with a signed waiver of confidentiality. An additional Notice of Allowance will be issued after the protest proceedings have been completed if only allowable claims remain in the application.

After a signed waiver has been filed, the application will be printed in the form of a patent and be available for sale as in the first Trial Voluntary Protest Program. At least one claim and a drawing figure, if any, will be printed in the OFFICIAL GAZETTE. These published applications will appear in about 6 to 9 issues of the OFFICIAL GAZETTE early in 1976. Advance notice will be given in the OFFICIAL GAZETTE of the dates on which applications will be published under this program.

Inspection of Files

The Patent and Trademark Office files of the published applications will be available for inspection by the public for a period of three months after publication. The application files will be retained in a single location in the Patent Issue Division during the protest period. This single location will be staffed with personnel to process papers directed to these files, supervise inspection of the files by the public, provide copies of file contents when ordered, and perform other related duties. A coin operated copying machine will also be available at this location.

Filing of Protests

Protests relating to the patentability of any published application must be filed in writing in the Patent and Trademark Office no later than three months after publication of the application. No extension of the three month protest period will be granted. Each protest must be filed in duplicate (one copy will be forwarded to the applicant and the other copy will be placed in the application file) and must indicate the grounds for protesting the allowance of any claim contained in the published application. If the protest involves prior art not of record in the application, two copies of the alleged prior art, together with an explanation of the relevance of such prior art to the allowed claims, should be included. The protester may also comment on the prior art record in the application and the manner in which it was applied.

In those applications where prima facie evidence of prior public use or sale the claimed invention is presented in accordance with 37 C.F.R. 1.292, public use proceedings will give the protester an opportunity to present evidence.

Should claims be copied from a published application for interference purposes, the applicant copying claims must also file a notice of such copying in the file of the published application to avoid the possibility of inadvertent issuance of the published application as a patent before conclusion of any interference proceedings.

For easy identification, all protests should be headed, "Protest Under Trial Voluntary Protest Program" and be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

The protester should fully identify himself and include his mailing address so that communications may be addressed to him. In view of administrative problems encountered in the first Trial Voluntary Protest Program in protecting the confidentiality of the identity of protesters, no attempt will be made by the Office to maintain the confidentiality of any protester under the new program.

If no protests are received during the protest period, the application file will be rerouted for the mailing of a new Notice of Allowance. The file will not be returned to the examining group except for consideration of matters which normally require return of an allowed file.

If one or more protests are filed in an application, the application file and the protest(s) will be returned to the examining group for consideration.

Consideration of Protest

The examining group will acknowledge receipt of all protests. The authority for deciding whether or not the evidence submitted constitutes a prima facie showing of unpatentability of any allowed claim will reside with the Group Director. If the Group Director decides that no such showing has been made, the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. Protesters will be notified in such cases that prosecution has not been reopened, and the applicant will be sent a duplicate copy of all protests. The decision of the Group Di-

rector will be final and will not be subject to petition by a protester.

If the Group Director decides that the submitted evidence constitutes a prima facie showing of unpatentability of any allowed claim, prosecution of the application will be reopened. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim considered unpatentable. The duplicate copy of each protest will be mailed to the applicant with the Office action. Protesters who submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and subsequent Office actions. Other protesters will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

Response by the Applicant to Subsequent Office Actions

During this period, the applicant may present amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters who submitted evidence on which a rejection in the Office action is based to participate in later prosecution and to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response filed, including any appeal brief. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

Comment on Applicant's Response by the Protester

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent and Trademark Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

Any appeal by the applicant to the Board of Appeals in a protested application will be made special and will be taken up out of order.

Conclusion of Prosecution

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified and the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. A decision of the primary examiner to allow an application will not be subject to petition or appeal by any protester.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Sept. 16, 1975.

[938 O.G. 945]

Availability of Consolidated Listing

The "Consolidated Listing of Recent Official Gazette Notices—Re Patent and Trademark Office Practices and Procedures" which appeared in the OFFICIAL GAZETTE of Jan. 6, 1976 is available in separate reprints at a price of $2.80 from the Superintendent of Documents, Washington, D.C. 20402. Please include the following information when ordering: Stock No. 003–004–00529–7, Catalog No. C21.5/A5: N845/976.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

Jan. 22, 1976.

International Trademark Classification

At its November 3–6, 1975 meeting, the Committee of Experts of the Nice Agreement decided to conduct a systematic overall review of the Classification. A working Group will consider all proposals for changes in the Classification submitted by the member countries and certain international and intergovernmental organizations. The entire review is expected to require 2 to 3 years. The Group's recommendations will then be submitted to the Committee of Experts which will determine the actual changes to be made. Concurrently, an Ad Hoc Committee will prepare a revision of the Nice Agreement, particularly with respect to Article 3(3), the unanimity rule.

Suggestions for changes were submitted to the Patent and Trademark Office last year when a general review of the Classification was first contemplated. Additional suggestions will be welcomed by the Office for consideration in the preparation of proposed changes to be submitted to the Committee of Experts. The Committee has requested that proposals be accompanied by an explanation of why the change is warranted. Suggestions should be sent, by March 5, 1976, to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Attention: Office of Legislation and International Affairs, Room 1108, CP–6

BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

Jan. 16, 1976.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,857,730, A. W. Vibber, APPARATUS FOR TWISTING AND PLYING STRANDS; **2,870,596,** same, TWISTING SPINDLE BALLOON CONTROL; **3,499,277,** same, APPARATUS FOR TWISTING AND PLYING STRANDS; **3,605,394,** same, STRAND PLYING METHOD AND APPARATUS; **Re. 24,380,** same, TWISTING AND PLYING SPINDLE BALLOON CONTROL, **filed** Jan. 12, 1972, D.C.N.J. (Newark), Doc. 62–72, *Alfred W. Vibber* v. *Uniroyal, Inc.* Order of dismissal of action, Oct. 8, 1975.

2,870,596. (See 2,857,730.)

2,910,927, I. F. Barnwell, MEANS FOR CONTROLLING AIR FLOW FROM A WALL DUCT; **3,052,011,** Brainard, Hansen, Sedgwick, Sipek, and Baechle, MACHINE TOOL WITH A MECHANICAL CUTTING TOOL CHANGER; **3,099,873,** Brainard and Merner, SHUTTLE OPERATED TAPE CONTROLLED MACHINE TOOL; **Re. 25,583,** Brainard, Hansen, Sedgwick, Sipek and Baechle, MACHINE TOOL WITH MECHANICAL CUTTING TOOL CHANGER; **Re. 25,737,** same; **Re. 25,812,** M. Morgan, AUTOMATIC MACHINE TOOL, **filed** Oct. 17, 1975, D.C., S.D. Ohio (Cincinnati), Doc. 6019 and 6146, *Kearny & Trecker Corp.* v. *Cincinnati Milacron, Inc. and Cincinnati Milacron Co.* Judgment, plaintiff is owner of all patents in the above action. Complaint is dismissed. The counterclaim for a declaration of invalidity of all the claims of said patents is dismissed as no justiciable issue is presented in view of such claims being void and/or unenforceable, Oct. 22, 1975.

3,052,011. (See 2,910,927.)

3,094,663, V. H. Siegel, MICROWAVE SIGNAL CHECKER FOR CONTINUOUS WAVE RADIATIONS, **filed** Oct. 23, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3–75–1312, *Radatron Corporation* v. *Autronics, Inc.*

3,099,873. (See 2,910,927.)

3,269,862, Lanza and Stivers, CROSSLINKED POLYVINYLIDENE FLUORIDE OVER A CROSSLINKED POLYOLEFIN, **filed** Oct. 8, 1975, United States Court for the First Circuit, Mass. (Boston), Doc. 75–1373, *International Telephone and Telegraph Corporation* v. *Rachem Corporation.*

3,311,047, Smith and Randall, ROOF VENTILATORS, **filed** Oct. 21, 1975, D.C., W.D. Mich. (Grand Rapids), Doc. G75–504–Cal, *H.C. Products Co.* v. *Leigh Products, Inc.*

3,432,605, Bolkcom and Knapp, SILICON CARBIDE FURNACES AND PLANTS; **Re. 27,018,** same, **filed** Sept. 30, 1975, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 73–1320, *Wilbur T. Bolkcom and William E. Knapp* v. *The Carborundum Company.* The decision of the District Court affirmed, Sept. 30, 1975.

3,485,587, A. S. Keston, PROTEIN INDICATOR, **filed** July 30, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2536, *Miles Laboratories, Inc.* v. *Boehringer Mannheim Corp. et al.*

3,499,277. (See 2,857,730.)

3,605,394. (See 2,857,730.)

3,757,087, D. P. E. Barnard, HEAT ELEMENTS, **filed** Oct. 21, 1975, D.C.N.J. (Camden), Doc. C–75–1826, *Interdynamics, Inc. and Smiths Industries, Limited* v. *Budge Mfg. Co., Inc.*

3,765,527, J. W. Vargo, DUAL-COMPARTMENT PACKAGE, **filed** July 22, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2062, *Filter Dynamics International, Inc. et al.* v. *Astron Battery Incorporated et al.* By agreement order cause dismissed with prejudice and without costs, Dec. 17, 1974.

3,854,630, R. E. Standridge, APPARATUS FOR INJECTING COLORANT INTO INJECTION MOLDING, **filed** June 24, 1975, D.C., N.D. Ga. (Atlanta), Doc. C-75-1216A, *Evans Products Company* v. *Standridge Corporation and Robert E. Standridge.* Dismissed with prejudice by plaintiff, Oct. 15, 1975.

Re. 24,380. (See 2,857,730.)

Re. 25,583. (See 2,910,927.)

Re. 25,737. (See 2,910,927.)

Re. 25,812. (See 2,910,927.)

Re. 27,018. (See 3,432,605.)

D. 237,228, B. H. Kaplan, FURNITURE SEAT, **filed** Oct. 21, 1975, D.C., W.D. Tenn. (Jackson), Doc. 75-85-E, *Rowe Furniture Corp.* v. *Gaines Manufacturing Company, Inc.*

D. 237,228, B. H. Kaplan, FURNITURE SEAT; **D. 237,230,** same, CHAIR, **filed** Oct. 22, 1975, D.C., W.D.N.C. (statesville), Doc. St-C-75-45, *Rowe Furniture Corporation* v. *Image Furniture Company.* **Same, filed** Oct. 22, 1975, D.C., W.D.N.C. (Statesville), Doc. ST-C-75-46, *Rowe Furniture Corporation* v. *Southern Furniture Company of Conover, Inc.*

D. 237,230. (See D. 237,228.)

PATENT NOTICES

Certificates of Correction for the Week of Feb. 17, 1976

Re. 28,554	3,890,578	3,905,703	3,914,301
3,517,359	3,891,366	3,905,812	3,914,379
3,615,317	3,891,654	3,905,867	3,915,113
3,725,093	3,891,922	3,905,880	3,915,122
3,727,366	3,892,704	3,905,914	3,915,160
3,729,226	3,893,189	3,905,955	3,915,391
3,737,666	3,893,227	3,906,026	3,915,545
3,806,145	3,894,026	3,906,093	3,915,747
3,807,223	3,894,373	3,906,184	3,915,829
3,818,299	3,894,457	3,906,593	3,916,135
3,835,148	3,894,883	3,906,690	3,916,142
3,838,664	3,894,909	3,906,791	3,916,190
3,839,321	3,895,553	3,906,811	3,916,546
3,842,308	3,895,867	3,906,943	3,916,660
3,842,743	3,896,179	3,907,106	3,916,767
3,843,985	3,896,883	3,907,196	3,916,910
3,850,985	3,897,470	3,907,304	3,917,604
3,855,099	3,897,659	3,907,415	3,917,673
3,856,074	3,898,003	3,907,560	3,917,690
3,856,428	3,898,070	3,907,597	3,917,718
3,857,838	3,898,277	3,907,722	3,917,935
3,861,056	3,898,327	3,907,822	3,918,108
3,865,767	3,898,329	3,908,044	3,918,206
3,866,066	3,898,479	3,908,059	3,918,217
3,868,163	3,898,792	3,908,084	3,918,307
3,868,360	3,898,838	3,908,157	3,918,535
3,868,691	3,899,592	3,908,484	3,918,609
3,868,817	3,899,775	3,908,729	3,918,610
3,869,005	3,899,909	3,908,833	3,918,684
3,869,523	3,900,121	3,909,549	3,919,291
3,871,265	3,900,660	3,909,578	3,919,332
3,871,369	3,900,815	3,909,690	3,919,333
3,876,619	3,901,180	3,910,016	3,919,424
3,876,766	3,901,217	3,910,177	3,919,547
3,876,826	3,901,762	3,910,184	3,919,892
3,878,217	3,901,921	3,910,389	3,919,972
3,878,656	3,902,082	3,910,475	3,920,052
3,879,513	3,902,212	3,910,805	3,920,117
3,879,960	3,902,311	3,910,945	3,920,118
3,881,523	3,902,627	3,911,073	3,920,303
3,882,103	3,902,839	3,911,162	3,920,504
3,882,686	3,903,011	3,911,428	3,920,626
3,883,438	3,903,145	3,911,460	3,920,676
3,884,247	3,903,529	3,911,552	3,920,686
3,884,546	3,903,709	3,912,015	3,920,812
3,885,584	3,903,856	3,912,068	3,920,868
3,886,133	3,904,010	3,912,565	3,920,927
3,886,923	3,904,324	3,912,607	3,921,193
3,887,112	3,904,518	3,912,944	3,924,214
3,887,244	3,904,579	3,912,249	3,928,297
3,887,601	3,904,604	3,913,294	
3,889,138	3,904,917	3,913,298	
3,890,433	3,904,987	3,914,285	

Patents Available for Licensing or Sale

D 235,134. MULTI-PURPOSE CLAMP FOR HOLDING WITHIN ITS TUBULAR ELEMENTS PENCILS, WIRES OR SIMILAR ARTICLES. James J. A. Sartore, 128 Morris St., Albany, N.Y., 12208.

3,826,717. QUANTITATIVE ANTIBIOTIC TEST CONTAINER. Dr. Verne E. Gilbert, 301 Blount Professional Building, Knoxville, Tenn., 37920.

3,837,428. ELECTRO-MAGNETIC SAFETY SKIFF. Leonard W. Gish, Route 1, Mount Iron, Minn., 55768.

3,844,748. HYDRO FILTRATION APPARATUS. Theodore Lanier, 620 Trinity Ave., Apt. E–4, Bronx, N.Y., 10455.

3,880,165. DISPOSABLE DIAPER WITH T-SHIRT HOLDING MEANS. Rose Prizzia, Weeds Mill Road, Highland, N.Y., 12528.

3,892,006. MULTI-BLADED WIPER FOR WINDSHIELD WIPER ASSEMBLY. Michio Yasumoto, 3909 NE. 135th, Portland, Oreg., 97230.

3,902,781. ASSEMBLY UNIT FOR THE CONSTRUCTION OF COMPOSITE LAMP HOLDERS. Nagel KG, Wesseling, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,911,752. REMOTE CONTROL APPARATUS FOR TELEVISION RECEIVERS. Joyce L. Olson, Arlington, Va., and Stephen A. Lazorcak, Jr., Arlington, Va. Correspondence to: Stephen A. Lazorcak, P.O. Box 33082, District Heights, Md., 20028.

3,911,846. STEPPED HULL FOR JET-POWERED BOAT. Wayne England, P.O. Box 1167, North Fork, Idaho, 83466.

3,911,989. TIRE CHANGER. William Vandenburg, Scranton, N. Dak., 58653.

3,916,459. TOILET BOWL VENTILATING APPARATUS IN KIT FORM. Marko Ivancevic, 423 N. Broadway, Redondo Beach, Calif., 90277.

3,917,275. GAME SUPPORT TRAY. Elliott J. Alpher, Washington, D.C. Correspondence to: Frederick L. Bergert, 1755 Jefferson Davis Highway, Suite 507, Arlington, Va., 22202.

3,920,775. FUEL INJECTOR. Anthony Greenfield, Baltimore, Md., assignor to Stanley Sollins, Baltimore, Md. Correspondence to: Sherman Levy, 635 Washington Bldg., 15th St. & New York Ave. NW., Washington, D.C., 20005.

3,921,564. PORTABLE BURGLAR ALARM. Harry A. Murray, 146 Red Stone Ridge, Delran, N.J., 08075.

3,921,863. JAR CAP DISPENSER. Irene P. Welch, 2001 Maple Glen Road, Sacramento, Calif., 95825.

3,924,966. WIND DRIVEN POWER GENERATOR. Robert J. Tamanini, 4 Pinewood Road, Wyomissing, Pa., 19610.

3,930,698. PLATE HOLDER AND DISPENSER. Bruce W. Calgan, 1 Stagecoach Road, Northfield, Vt., 05663.

3,934,666. BIKE BOOSTER. Robert W. Ellington, 4414 Concho St., Dallas, Tex., 75206.

Eastman Kodak Company announces that non-exclusive licenses are available to responsible applicants under the following 1 patent.

Application for licenses may be addressed to the Director, Patent Department, Eastman Kodak Company, 343 State St., Rochester, N.Y., 14650.

3,487,762. IRIS TYPE DIAPHRAGM.

General Electric Company is prepared to grant non-exclusive licenses under the following 59 patents on reasonable terms to domestic manufacturers.

Applications for licenses under the following 5 patents may be addressed to: General Electric Company, Construction Materials Div., 101 E. Carmel Drive, Suite 205, Carmel, Ind., 46032, Attention: Division Patent Counsel.

3,813,771. METHOD OF PRODUCING ELECTRICAL RESISTANCE HEATERS AND THE IMPROVED HEATER PRODUCTS.

3,815,015. TRANSFORMER-DIODE ISOLATED CIRCUITS FOR HIGH VOLTAGE POWER SUPPLIES.

3,890,562. REGULATED POWER SUPPLY UTILIZING A HALFWAVE SWITCH.

3,892,115. METHOD AND MACHINE FOR FORMING LAMINATIONS FOR USE IN SELF LOCKING CORES.

3,898,517. BALLAST CIRCUIT.

Application for license under the following 4 patents may be addressed to: General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn., 06602.

3,728,805. MULTI-FUNCTION STEAM IRON.

3,738,033. STEAM FLATIRON.

3,758,969. FAST START SPRAY IRON.

3,884,543. APPLIANCE CORD ANCHOR.

Application for license under the following 4 patents may be addressed to: General Electric Company, Appliance Components Bus., Division, 1635 Broadway, Fort Wayne, Ind., 46804.

3,903,395. TEMPERATURE CONTROL SYSTEM.

3,909,768. TERMINAL MOUNT FOR AN ELECTRICAL DEVICE.

3,911,682. THERMAL ACTUATOR.

3,912,957. DYNAMOELECTRIC MACHINE STATOR ASSEMBLY WITH MULTI-BARREL CONNECTION INSULATOR.

Application for license under the following 19 patents may be addressed to: General Electric Company, Patent Counsel, Silicone Products Department, Chemical and Metallurgical Division, Waterford, N.Y., 12188.

3,047,528. ELASTOMER COMPOSITION.

3,057,821. AMMONIUM HALIDE STABILIZED ORGANOPOLYSILOXANES.

3,271,359. EQUILIBRATION OF ORGANOPOLYSILOXANES USING PHOSPHOROUS-CONTAINING CATALYSTS.

3,318,843. PROCESS FOR MAKING EQUILIBRATION FOR ORGANOPOLYSILOXANES USING PHOSPHOROUS-CONTAINING CATALYSTS.

3,328,347. NITRILE - CONTAINING ORGANOSILICON POLYMERS.

3,332,974. PURIFICATION OF CYCLIC ORGANOPOLYSILOXANES WITH HEAT-ACTIVATED METAL HYDRIDES.

3,352,799. ORGANOSILICON CARBOIMIDE POLYMER.

3,378,521. ORDERED ORGANOPOLYSILOXANES.

3,506,699. HETEROCYCLIC COMPOUNDS CONTAINING HETERO SULFUR AND SILICON ATOMS.

3,673,272. BLOCK COPOLYMERS OF SILICONES WITH VINYL PYRIDINE.

3,234,180. SILOXY POLYMERS.

3,261,807. ORGANOSILICON MATERIALS.

3,324,157. METALLOCENYL - SUBSTITUTED ORGANOPOLYSILOXANES.

3,326,952. METALLOCENYL - SUBSTITUTED ORGANOSILICON MATERIALS

3,414,597. METALLOCENYLARYL - SUBSTITUTED ORGANOSILICON MATERIALS.

3,432,488. SOLUBLE SILYLATED CELLULOSE & METHOD OF PREPARING SAME.

3,544,498. DETERGENT RESISTANT SILICONE POLISH.

3,576,779. AMINE - FUNCTIONAL ORGANOPOLYSILOXANE SALT THEREOF & POLISH COMPOSITION THEREFROM.

3,662,765. SMOKE FILTER.

Applications for license under the following 16 patents may be addressed to: Gas Turbine Products Division, General Electric Company, 1 River Road, Building No. 500–2nd Floor, Schenectady, N.Y., 12345.

3,690,874. GRAIN SIZE OF METAL CASTINGS.

3,725,057. GRAIN SIZE OF METAL CASTINGS.

3,736,071. BUCKET TIP/COLLECTION SLOT COMBINATION FOR OPEN-CIRCUIT LIQUID-COOLED GAS TURBINES.

3,802,797. REVERSING TURBINE FLOW DIVIDER SUPPORT.

3,804,551. SYSTEM FOR THE INTRODUCTION OF COOLANT INTO OPEN-CIRCUIT COOLED TURBINE BUCKETS.

3,816,022. POWER AUGMENTER BUCKET TIP CONSTRUCTION FOR OPEN-CIRCUIT LIQUID COOLED TURBINES.

3,831,373. PUMPED AIR STORAGE PEAKING POWER SYSTEM USING A SINGLE SHAFT GAS TURBINE-GENERATOR UNIT.

3,844,679. PRESSURIZED SERPENTINE COOLING CHANNEL CONSTRUCTION FOR OPEN-CIRCUIT LIQUID COOLED TURBINE.

3,848,307. MANUFACTURE OF FLUID-COOLED GAS TURBINE AIRFOILS.

3,849,025. SERPENTINE COOLING CHANNEL CONSTRUCTION FOR OPEN-CIRCUIT LIQUID COOLED TURBINE BUCKETS.

3,851,607. REGENERATOR SUPPORT SYSTEM FOR MARINE GAS TURBINE.

3,856,433. LIQUID COOLED TURBINE BUCKET WITH DOVETAILED ATTACHMENT.

3,866,674. GAS TURBINE REGENERATOR.

3,867,060. SHROUD ASSEMBLY.

3,877,519. PRESSURIZED STRONGBACK REGENERATOR.

3,904,317. BUCKET LOCKING MECHANISM.

Application for license under the following 11 patents may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,739,552. AIR FILTER UTILIZING SPACE TRAPPING OF CHARGED PARTICLES.

3,739,554. AIR FILTER UTILIZING ALTERNATING CURRENT ELECTRIC FIELDS.

3,742,874. SOLID WASTE INCINERATOR.

3,746,416. MODULAR FURNITURE SYSTEM AND MEANS FOR MANIPULATING AND CONNECTING COMPONENTS THEREOF.

3,746,417. FURNITURE SYSTEM HAVING MEANS FOR CONNECTING SUB-ASSEMBLIES THEREOF.

3,899,658. SHEATHED HEATING ELEMENT INSTALLATION.

3,902,629. COMPRESSOR TUBE CONNECTOR SEAL.

3,903,911. DISHWASHER SPRAY SYSTEM.

3,908,681. FORCED AIR CIRCULATION SYSTEM FOR A DISHWASHER.

3,911,247. THERMOSTAT MOUNTING DEVICE FOR PLASTIC TUB DISHWASHER.

3,921,253. FASTENING DEVICE FOR HINGEDLY ASSEMBLING MEMBERS.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 36 patents.

Inquires respecting licenses under these patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

3,917,378. FREQUENCY-ENCODED FOCUSSED IMAGE HOLOGRAM RECORD.

3,917,903. DETACHABLE PICKUP ARM MAGNETIC COUPLING.

3,917,925. EMBOSSED CHARACTER READER.

3,917,964. SIGNAL TRANSLATION USING THE SUBSTRATE OF AN INSULATED GATE FIELD EFFECT TRANSISTOR.

3,917,980. PROTECTION CIRCUIT.

3,918,007. FABRY-PEROT POLARIZATION LASER BEAM MODULATOR.

3,918,039. HIGH-RESOLUTION DIGITAL GENERATOR OF GRAPHIC SYMBOLS WITH EDGING.

3,918,226. THERMOPLASTIC HEAT RESPONSIVE FIRE VENT APPARATUS.

3,918,815. DENSITOMETER FOR MEASURING AVERAGE APERTURE DIAMETER.

3,918,982. BLACK CERAMIC BODY.

3,919,468. CHARGE TRANSFER CIRCUITS.

3,919,472. AUTOMATIC TARGET CONTROL SYSTEM FOR A TELEVISION CAMERA TUBE.

3,919,484. LOOP CONTROLLER FOR A LOOP DATA COMMUNICATIONS SYSTEM.

3,919,582. TARGET MOUNTING STRUCTURE FOR USE IN CAMERA TUBE.

3,919,589. ELECTROLUMINESCENT CELL WITH A CURRENT LIMITING LAYER OF HIGH RESISTIVITY.

3,919,649. STAIRCASE WAVEFORM GENERATOR.

3,919,714. AUTOMATIC PEAKING APPARATUS.

3,920,861. METHOD OF MAKING A SEMICONDUCTOR DEVICE.

3,920,892. ALTERNATING CURRENT LINE VOLTAGE SUPPLY ISOLATION USING DEFLECTION SYSTEM OUTPUT TRANSFORMER.

3,921,010. PEAK VOLTAGE DETECTOR CIRCUITS.

3,921,013. BIASING CURRENT ATTENUATOR.

3,921,022. FIELD EMITTING DEVICE AND METHOD OF MAKING SAME.

3,921,056. FREQUENCY MULTIPLIER CIRCUIT.

3,921,090. OPERATIONAL TRANSCONDUCTANCE AMPLIFIER.

3,921,879. WEB ADVANCE MECHANISM.

3,921,885. METHOD OF BONDING TWO BODIES TOGETHER.

3,922,049. METHOD OF DEGASSING A CATHODE-RAY TUBE PRIOR TO SEALING.

3,922,394. METHOD FOR COATING FERROUS-METAL MASK FOR CATHODE-RAY TUBE.

3,922,395. METHOD FOR APPLYING ORGANIC POLYMERIC COATING COMPOSITION TO FERROUS-METAL SURFACES.

3,922,416. MEDIUM FOR RECORDING PHASE HOLOGRAMS.

3,922,420. METHOD OF MAKING A SEMI-TRANSPARENT PHOTOMASK.

3,922,536. MULTINOMIAL PROCESSOR SYSTEM.

3,922,540. APPROXIMATOR FOR SQUARE ROOT OF SUMS OF SQUARES.

3,922,587. DIGITAL FEEDBACK RELAY CONTROLLER.

3,922,593. CIRCUIT FOR PRODUCING ODD FREQUENCY MULTIPLE OF AN INPUT SIGNAL.

3,922,703. ELECTROLUMINESCENT SEMICONDUCTOR DEVICE.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 17, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-19-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-3-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-10-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-5-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-23-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-12-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-1-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-18-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-10-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	9-23-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-10-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	4-15-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-2-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-13-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-25-75

Expiration of patents: The patents within the range of numbers indicated below expire during February 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 600, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,871,479 to 2,875,444 inclusive
Plant Patents..... Numbers 1,805 to 1,813 inclusive

PATENT APPLICATIONS

PUBLISHED FEBRUARY 17, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE- A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published applications must be filed in writing before April 13, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

Printed copies of the published applications may be purchased from the Patent and Trademark Office at 50 cents each.

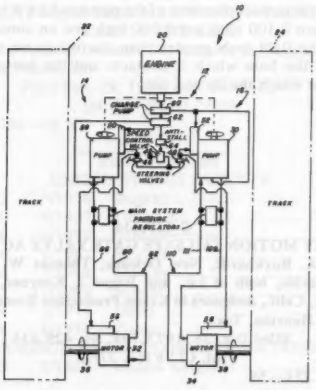
An "Index of Applicants and Assignees of Published Applications" and a concordance entitled "Classification of Published Patent Applications" are located in the back of this issue.

GENERAL AND MECHANICAL APPLICATIONS

B 400,871
HYDROSTATIC TRANSMISSION DRIVE SYSTEM
Edward J. Bojas, and Harold R. Ward, both of Marshall, Mich., assignors to Eaton Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 248,685, April 28, 1972, Pat. No. 3,795,109. This application Sept. 26, 1973, Ser. No. 400,871
Int. Cl.² F16D *31/02*
U.S. Cl. 60—445 **32 Claims**

References Cited
UNITED STATES PATENTS

2,518,578	8/1950	Tomlinson	60/447
2,880,586	4/1959	Lincoln	60/447
3,234,856	2/1966	Martin	180/6.48
3,238,723	3/1966	Young	60/444
3,279,637	10/1966	Olson et al.	180/6.48
3,368,425	2/1968	Lewis	74/720
3,442,344	5/1969	Ocule	180/6.48
3,526,288	9/1970	Cryder et al.	60/447
3,650,107	3/1972	Court	60/443
3,727,402	4/1973	Keith et al.	60/444
3,795,109	3/1974	Bojas et al.	60/490



1. An apparatus comprising a hydrostatic transmission, said hydrostatic transmission including a pump unit, a motor unit adapted to be connected with an output member, and first conduit means having one passage for conducting relatively high pressure fluid from said pump unit to said motor unit and another passage for conducting relatively low pressure fluid from said motor unit to said pump unit, charge pump means for supplying fluid to said hydrostatic transmission, actuator means for varying the effective displacement of at least one of said units of said hydrostatic transmission to vary the speed at which the output member is driven by said motor unit, said actuator means including pressure responsive motor means for effecting a variation in the displacement of said one unit in response to a variation in control fluid pressure, second conduit means for conducting control fluid pressure to said motor means, pressure controller means for varying the control fluid pressure conducted to said motor means to vary the speed at which the output member is driven by said first motor unit, said pressure controller means being operable from a neutral setting in which said motor unit is substantially ineffective to drive the output member to any one of a plurality of operating settings in each of which said pressure controller means is effective to port a different fluid pressure to said motor means, and control means for varying the control fluid pressure ported to said motor means in response to a decrease in the fluid pressure output of said charge pump means while maintaining the setting of said pressure controller means substantially constant to effect a reduction in the speed at which said output member is driven, said control means including pressure responsive valve means for decreasing the relatively high fluid pressure in said one passage in response to a decrease in the charge pressure during operation of said hydrostatic transmission, said valve means including a valve operable from a closed condition to an open condition enabling relatively high pressure fluid to flow from said one passage and means for effecting operation of said valve from the closed condition to the open condition in response to a decrease in the charge pressure.

B 423,441
MINIMIZATION OF RESIDUAL SPACECRAFT NUTATION DUE TO DISTURBING TORQUES
Kevin John Phillips, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Dec. 10, 1973, Ser. No. 423,441
Int. Cl.² B64G *1/20*
U.S. Cl. 244—169 **7 Claims**

References Cited
UNITED STATES PATENTS

2,974,594	3/1961	Boehm	244/1 SA
3,135,479	6/1964	Badewitz	244/1 SA
3,384,323	5/1968	Gilbert et al.	244/1 SA
3,414,214	12/1968	Robinson et al.	244/1 SA
3,437,288	4/1969	Lam	244/3.22
3,643,897	2/1972	Johnson	244/1 SA
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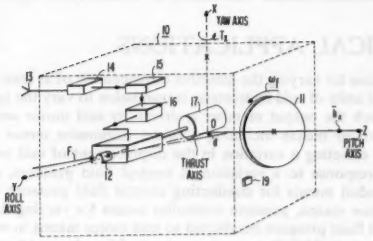
OTHER PUBLICATIONS

P. C. Wheeler, "Two–Pulse Attitude Control of an Asymmetric Spinning Satellite," AIAA Guidance and Control Conference, 8–12–63.



1. A method for minimizing nutation in a spacecraft of the dual spin type having a spin axis and a characteristic nutation period and further having a platform despun from a spinning member, comprising the steps of:

transmitting signals to spacecraft receiver means causing a receiver means output signal;

coupling said receiver output signal to logic circuit means causing a logic circuit means output signal;

activating a force generating means mounted on said platform a first time for a predetermined operating period T_1 in response to said logic circuit output signal, said predetermined operating period determined by said logic means to be a predetermined portion of said nutation period of said spacecraft;

deactivating said force generating means for a waiting period T_w, in response to said logic circuit means output signal at the end of said predetermined operating period T_1;

activating said force generating means automatically a second time in response to said logic circuit means output signal for said predetermined operating period T_1 after said waiting period T_w, wherein said waiting period, T_w, is determined by:

$$T_w = \frac{2}{\omega_n} \tan^{-1}\left[\frac{1+\cos \omega_n T_1}{\sin \omega_n T_1}\right]$$

where ω_n is the spacecraft nutation frequency and T_1 is said force generating means operating period.

B 426,819

POLYTETRAFLUOROETHYLENE LIP SEAL

Robert M. Smith, Dayton, Ohio, assignor to The Duriron Company, Inc., Dayton, Ohio

Filed Dec. 20, 1973, Ser. No. 426,819

Int. Cl.² F16J 15/32

U.S. Cl. 277—184 6 Claims

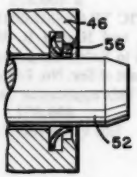
References Cited

UNITED STATES PATENTS

2,743,119	4/1956	Covert et al.	277/188
3,118,681	1/1964	Fuehrer	277/9

FOREIGN PATENTS OR APPLICATIONS

928,749	6/1963	United Kingdom	277/DIG. 6



1. A polytetrafluoroethylene lip seal for use as an O.D. lip seal on a part having an annular groove formed therein and adapted to fit within a bore, said lip seal to seal against unidirectional fluid flow between said part and said bore, comprising a curved, unitary, internally stressed polytetrafluoroethylene frusto-conical shape stretch-formed from a flat annulus having a substantially uniform thickness of at least 0.010 inch but less than the width of the groove into which said lip seal is to sit, an interference between the inside diameter of the seal and the outside diameter of the part to which it is attached of between 0.100 inch and 0.200 inch and an annulus width of at least 0.04 inch greater than the maximum clearance between the bore which it contacts and the bottom of the groove in which the lip seal sits.

B 429,434

ROTARY MOTION FAILSAFE GATE VALVE ACTUATOR

Joseph A. Burkhardt, New Orleans; Thomas W. Childers, Mandeville, both of La., and Roger J. Koerner, Fountain Valley, Calif., assignors to Exxon Production Research Company, Houston, Tex.

Filed Dec. 28, 1973, Ser. No. 429,434

Int. Cl.² F16K 31/12

U.S. Cl. 251—58 19 Claims

References Cited

UNITED STATES PATENTS

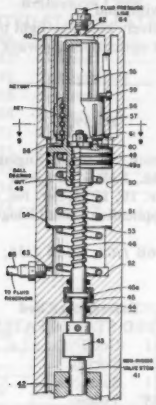
2,709,062	5/1955	Lamb	251/14
2,883,144	4/1959	Kendig	92/33
3,450,382	6/1969	Calim	92/31
3,512,421	5/1970	Anderson	74/89.15
3,628,397	12/1971	Sheesley	74/424.8 VA
3,640,140	2/1972	Gulick	74/89.15

1. A valve actuator for a valve comprising:

a housing having a fluid pressure inlet, a fluid pressure exhaust, and an inner sealing shoulder;

a rotatable screw shaft arranged in said housing connectable at one end to said valve;

a ball bearing nut mounted on the other end of said shaft and forming a piston longitudinally movable in said housing from a first to a second position;



biasing means surrounding said screw shaft engaging said piston and urging said piston to said first position thereof; said piston containing peripheral seals for sealing engagement with the inner wall of said housing; said piston sealingly engaging said inner sealing shoulder of said housing when said piston is in said second position thereof; and

means connected to said piston engaging said housing to prevent rotation of said piston.

B 443,647

RESILIENT MOUNTING MEANS FOR A PROTECTION CAB OR THE LIKE

Richard D. Palmer, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 19, 1974, Ser. No. 443,647
Int. Cl.² B62D *27/04*
U.S. Cl. 296—35 R **4 Claims**

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3,797,604	3/1974	Davis	296/35 R
3,831,704	8/1974	Zuege	296/35 R

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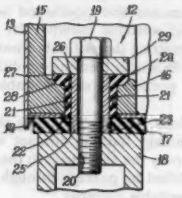
5,503	2/1889	United Kingdom	296/35 R

1. A cushioned fastening device for mounting protective cabs and the like on a vehicle, comprising a rubber-like base pad disposed between the vehicle and the cab, securing means for holding the cab securely on the vehicle over said base pad, a metallic cylindrical spacer, a rubber bushing banded to the outer surface of said spacer and on said securing means to provide a complete dampening barrier between the cab and the main body of the vehicle, members at the lower end of the cab formed to receive the securing means and said rubber bushing, said bushing having a flanged section at the upper end thereof formed to fit over said members of the cab, the securing means comprises a bolt and washer assembly sized to fit through said spacer and threadably engage the frame of the vehicle, and in which the members of the cab have accurately machined vertically oriented bore holes extending therethrough toward said frame and sized to receive said rubber bushing, and in which each bore hole has an annular recess at the upper end thereof sized to receive the flanged portion of said rubber bushing, whereby the bolt and the washer assembly will be above and in close proximity to said recess in said



members upon complete assembly of said fastening device with said washer overlapping the members of the cab above said recess and around said hole and squeezes the flanged section of the bushing in said annular recess against said member of the cab and is accurately positioned by the metallic cylindrical spacer disposed with one end abutting the bolt and washer assembly and the other end abutting the frame of the vehicle, whereby the cab is securely held in the event of turnover or the like, because only slight movement is permitted before strong metal-to-metal contact is obtained.

B 447,440

APPARATUS FOR MOISTURE ADDITION TO ENGINE AIR-FUEL INPUT

Edward M. Geiser, Downers Grove, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 1, 1974, Ser. No. 447,440
Int. Cl.² F02D *19/00*
U.S. Cl. 123—25 R **6 Claims**

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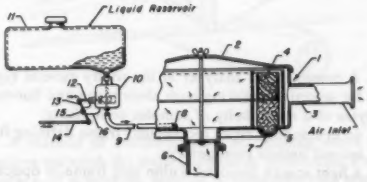
FOREIGN PATENTS OR APPLICATIONS

609,603	10/1948	United Kingdom	123/25 E



1. In an internal combustion engine, means for providing moisture to the fuel-air mixture passing to the fuel intake

means for said engine, said first named means comprising in combination,

a. an air intake means to said engine, an upper air filter element and an air pervious wettable member positioned therebelow and adjacent thereto, said element and member being disposed adjacent to said air intake means, said member being positioned in only a portion of the flow path of air from said air intake means,

b. a holding means for said wettable member,

c. a fillable liquid retaining means in interconnection with said holding means and positioned adjacent the lower portion of said wettable member for contact therewith and to effect wetting thereof only from the lower surface thereof whereby, under freezing conditions, ice formation in the upper portion of said wettable member is precluded, and

d. means for at least periodically filling said liquid retaining means to maintain fluid in contact with said wettable member, whereby the air stream to the fuel supply means will be humidified by passage through and over the surface of said wettable member.

B 450,521

COMPACT FAST ANALYZER OF ROTARY CUVETTE TYPE

Louis H. Thacker, Knoxville, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 12, 1974, Ser. No. 450,521
Int. Cl.² G01N *21/24*
U.S. Cl. 356—201 **5 Claims**

References Cited
UNITED STATES PATENTS

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3,700,335	10/1972	Seelbinder	356/201
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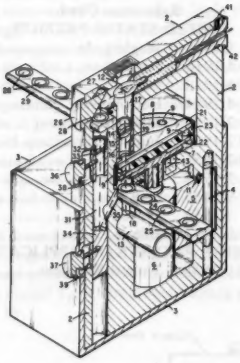
3,800,161	3/1974	Scott et al.	250/564
3,824,402	7/1974	Mullaney et al.	250/565



1. A compact fast analyzer of the rotary cuvette type suitable for selectively making both absorbance and fluorescence analyses of a multiplicity of samples comprising:

a. an upstanding, rigid, rectangular frame defining first and second optical passageways;

b. a light source disposed within said frame in optical communication with said first and second optical passageways;

c. a photodetector disposed within said frame in optical communication with said first and second optical passageways;

d. a motor-driven rotor mount pivotally attached to said frame, said rotor mount being selectively movable to an operating position intermediate said light source and photodetector and in optical communication with said first and second optical passageways and to a rotor loading position displaced from said operating position;

e. a cuvette rotor defining a circular array of sample analysis cuvettes removably disposed on said rotor mount and rotatable therewith; and

f. means for selectively blocking light passage through said first and second optical passageways.

B 459,597

WALLS

Jonathan Clive Pearson, Sheffield, England, assignor to Ellis Pearson & Co., Ltd., United Kingdom

Filed Apr. 10, 1974, Ser. No. 459,597
Claims priority, application United Kingdom, Apr. 12, 1973, 17571/73
Int. Cl.² E06B *1/04*; E04B *5/56*; E06B *3/70*
U.S. Cl. 52—207 **9 Claims**

References Cited
UNITED STATES PATENTS

982,226	7/1911	Good	292/DIG. 63
1,619,811	3/1927	Coryell	52/457
1,799,482	4/1931	Schlacks	52/207
1,987,380	1/1935	Triller	52/509
2,059,489	11/1936	Reisig	52/314
2,173,758	9/1939	Lynch et al.	52/207
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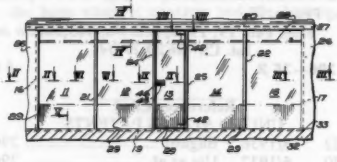

1. An assembly for forming a wall substantially of glass comprising a plurality of glass sheets in abutment to each other, a pair of side channels with resilient linings fitted to the end pair of glass edges, a bottom channel with a resilient lining fitted along the bottom edges of the glass sheets, a top channel with a resilient lining fitted along the top edges of the glass sheets, a pillar overlapping each pair of abutting glass edges on only one side of said glass sheets and spaced therefrom by a resilient strip to provide intermediate support for said glass sheets, a door comprising a glass sheet, pivots secured to the door and to the top and bottom channels, a pair of pillars flanking the door, and a latch carried by the door and engageable with one of the pillars flanking the door, the door being provided with a small hole for access to the latch from the face of the door remote from the latch.

B 469,228

PUSH BUTTON SWITCH MODE INDICATOR ELEMENT

Kenneth Lee Roy, Menomonee Falls, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed May 13, 1974, Ser. No. 469,228
Int. Cl.² G09F 9/00; H01H 9/16
U.S. Cl. 116—124 L 7 Claims

References Cited
UNITED STATES PATENTS

513,705	1/1894	Busby	116/172
2,293,752	8/1942	O'Brien	200/340 X
2,447,453	8/1948	Zehnpfennig	200/340 X
3,250,887	5/1966	Sorenson	200/308
3,375,337	3/1968	Barrett et al.	200/308 X
3,576,175	4/1971	Cammill	116/124 L
3,715,548	2/1973	Schadow	116/124 X
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3,855,959	12/1974	Hinze	200/167 A X
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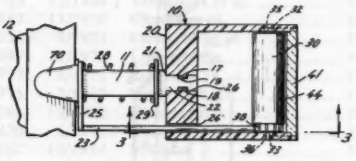


1. A mode indicating device for a pushbutton switch, said switch having a body and a reciprocating slider moveable between a first position in which said switch is in one mode and a second position in which said switch is in a second mode, said indicating device comprising:

a hollow housing attached to said slider, said housing having a lens in one end an on aperture at the opposite end;

a mode indicator rotatably mounted within said housing adjacent the interior of said lens, said indicator being rotatable about an element having an axis which is fixed relative to said housing, said element extending transverse to the direction of movement of said slider between opposed walls of said housing, said mode indicator having a rounded surface formed about said fixed axis and having mode indicating indicia formed thereon; and

actuator means having one end coupled to said switch body and the other end extending through said aperture and means pivotally coupled to said mode indicator for pivoting said indicator in response to movement of said slider and housing to position said indicia adjacent said lens when said switch is in said second mode.

B 486,614

MAGNETIC MIXER

Robert D. Cichy, Maumee, Ohio; Anthony P. Schmid, Riga, Mich., and Barry Watson, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed July 8, 1974, Ser. No. 486,614
Int. Cl.² B01F 13/08
U.S. Cl. 259—4 2 Claims

References Cited
UNITED STATES PATENTS

3,689,033	9/1972	Holmstrom	259/DIG. 46

FOREIGN PATENTS OR APPLICATIONS

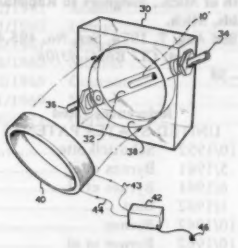
991,941	10/1951	France	259/DIG. 46

1. A magnetic mixing device for mixing a moving fluid stream which comprises, in combination:

a block of non-magnetic material, said block including a recess formed in one face thereof and further including a passage extending completely therethrough behind said recess in close proximity thereto but not in communication with said recess, said passage defining a flow tube;

a elongated magnetic stirring element contained within said passage;

means for limiting the travel of said stirring element, in engagement with both ends of said passage, to prevent



movement of said stirring element out of said flow tube and to allow movement of said fluid stream through said passage;

a coil formed of electrically conductive material positioned in said recess in said block; and

means for furnishing a low voltage oscillating electrical supply to said coil to thereby generate an oscillating magnetic field in said passage for causing said magnetic stirring element to oscillate longitudinally in said passage.

B 489,290

ELECTROMAGNETIC DENT PULLER

Karl A. Hansen, and Iver Glen Hendrickson, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed July 17, 1974, Ser. No. 489,290
Int. Cl.² B21D 26/14
U.S. Cl. 72—56 32 Claims

References Cited
UNITED STATES PATENTS

3,196,649	7/1965	Furth	29/421 M X
3,703,958	11/1972	Kolm	72/56
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FOREIGN PATENTS OR APPLICATIONS

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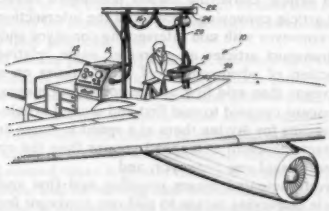

20. A method of electromagnetically pulling dents from conductive material, the steps comprising: positioning a working surface of a working head of a nonconducting material adjacent a dent in a part; energizing a coil within the head, shaped for electromagnetic coupling to the part, with a slowly rising current; controlling the amplitude and duration of the current for generating a strong electromagnetic field without

deforming the part; introducing a countercurrent into the coil; controlling the amplitude of the countercurrent to about 50 to 100 percent of the slowly rising current; and timing the duration of the countercurrent to generate a deforming tensioning magnetic force against the part to remove the dent.

B 495,402

CONVEYOR DIVERTER

Wesley R. Maxted, Grand Rapids, and Bernard H. Woltjer, Jenison, both of Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.

Filed Aug. 7, 1974, Ser. No. 495,402
Int. Cl.² B65G *43/08*
U.S. Cl. 198—38 **16 Claims**

References Cited
UNITED STATES PATENTS

2,613,790	10/1952	Schottelkotte	193/36
2,985,274	5/1961	Byrnes et al.	198/20 R
2,988,196	6/1961	Byrnes et al.	198/20 R
3,018,873	1/1962	Burt	198/38
3,058,565	10/1962	Byrnes	198/20 R
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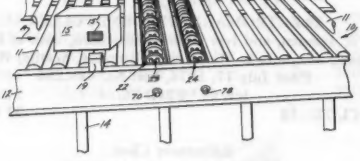
3,650,375	3/1972	Fleischauer et al.	198/127 R



1. A diverter for selectively diverting articles from one conveyor to an intersecting conveyor comprising:

first article conveying means positioned on said one conveyor upstream of the intersecting conveyor and skewed to transport articles at an angle relative to the direction of advancement of such articles on said one conveyor;

second article conveying means positioned between said first article conveying means and the intersection of said one conveyor with said intersecting conveyor and skewed to transport articles at a greater angle relative to the direction of advancement of such articles on said one conveyor than said first article conveying means;

drive means coupled to said first and second article conveying means for driving them at a speed to move articles in contact therewith at a speed greater than the conveying speed of said one conveyor; and

selectively actuated means coupling said first and second article conveying means to said one conveyor for moving said first and second article conveying means between an operative position with said first article conveying means extending above said one conveyor a predetermined distance and said second article conveying means extending above said one conveyor a greater predetermined distance than said first article conveying means for progressively elevating and rotating articles onto said intersecting conveyor and an inoperative position where articles continue along said one conveyor.

B 497,853

VOLUME SETTING MECHANISM FOR FLUID DISCHARGE DEVICES

Richard Dean Reed, San Jose, and Doud Roger Branham, Redwood City, both of Calif., assignors to Oxford Laboratories Inc., Foster City, Calif.

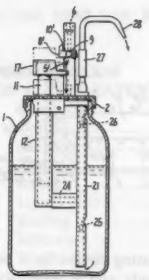
Filed Aug. 16, 1974, Ser. No. 497,853
Int. Cl.² G01F *11/06*
U.S. Cl. 222—43 **2 Claims**

References Cited
UNITED STATES PATENTS

1,581,298	4/1926	Schotthoefer	222/43 X
2,776,075	1/1957	Etter	222/43
2,985,339	5/1961	Fischer et al.	222/44
3,176,876	4/1965	Fischer et al.	222/44
3,452,901	7/1969	Roach	222/49

FOREIGN PATENTS OR APPLICATIONS

905,949	9/1962	United Kingdom	222/43



1. In a fluid dispensing device that comprises:

a barrel forming a fluid chamber,

a plunger positioned with one end extending into said barrel and another end remaining outside of said barrel,

an operating handle attached to the plunger at its outside end,

means permitting fluid to be drawn into said chamber when the plunger is moved in a direction out of the chamber and permitting fluid to be discharged when the plunger is moved in an opposite direction into said chamber,

an elongated scale post held fixed with respect to said barrel, and characterized by a uniform shape along at least a portion thereof in a cross-section perpendicular to its length, said shape including a circular portion joined by substantially a straight line, thereby to form a substantially flat portion along its length, said scale post further including along said substantially flat portion a plurality of indicia lines arranged parallel to one another and perpendicular to the length of the post in a row,

a stop surrounding said post with a circular interior surface shape in cross-section that is complementary to the outside post shape and movable along the length of said post and selectively attachable thereto, said stop being positioned to abut said handle as the plunger is moved outward of said barrel, said stop additionally having a pointer that moves from one parallel indicia line to another as the stop is moved along the length of said scale post, and

means for selectively fastening said stop to said scale post against movement therealong at desired positions corresponding to a desired plunger fluid volume;

the improvement comprising:

said indicia lines being raised above said substantially flat portion of said scale post in a manner to form notches therebetween,

said pointer being shaped for insertion into any of said notches in a manner to hold said stop from movement

along the length of said scale post, and said stop being rotatable about said scale post at least from an extreme position wherein said pointer is fully nested within the desired position of one of said notches to at least a second extreme position wherein said pointer clears said raised indicia lines to permit movement of said stop along the length of said scale post,

whereby the volume of fluid dispensed by said device is accurately set by positive detent engagement.

B 501,122

TYPING MACHINE KEY ACTION

Hans W. Mueller, and Richard E. Shattuck, both of Cortland, N.Y., assignors to SCM Corporation, New York, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,122
Int. Cl.² B41J *23/06*
U.S. Cl. 197—17 **12 Claims**

References Cited
UNITED STATES PATENTS

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3,419,123	12/1968	Salzberger et al.	197/17
3,537,562	11/1970	Caudill et al.	197/17
3,578,128	5/1971	Frechette et al.	197/17
3,623,587	11/1971	Link	197/17
3,633,723	1/1972	Kosters	197/17
3,638,775	2/1972	Hishida et al.	197/17
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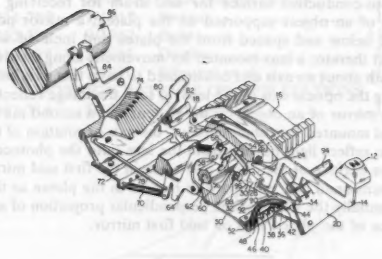
3,738,470	6/1973	Osaka	197/17
3,838,762	10/1974	Madison	197/17



1. In a typing machine of the kind having means for actuating a typing machine operation, a power roll rotatably mounted in the typing machine for engagement by the actuating means to actuate the typing machine operation, a key lever movably mounted in the typing machine, an interposer, means for supporting the interposer, means for releasing the interposer relative to the supporting means upon depression of the key lever, and means for restoring the key lever to a rest position, in combination, the improvement comprising:

a. means, connected between the interposer and a stationary portion of the typing machine, for biasing the interposer against the supporting means and after activation of the releasing means, against the actuating means to cause the actuating means to engage the power roll to actuate the typing machine operation; and

b. means for restoring potential energy in the biasing means during return of the key lever to the rest position by the restoring means.

B 506,926

SHUTTLE MECHANISM

Neil S. White, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 17, 1974, Ser. No. 506,926
Int. Cl.² B65H *17/40*
U.S. Cl. 226—68 **7 Claims**

References Cited
UNITED STATES PATENTS

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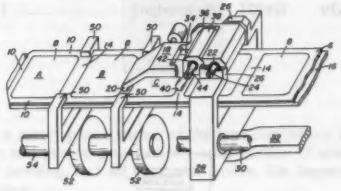
2,996,001	8/1961	Schlegel	226/147 X
3,051,361	8/1962	Menkel	226/151 X
3,434,640	3/1969	Coutant	226/62 X
3,477,627	11/1969	Webers	226/62 X
3,587,960	6/1971	Gerb	226/62



1. In a shuttle mechanism for use in intermittently transporting a stretchable web having spaced first, second, and third succeeding grooves of a normal pitch in its normal unstretched condition; the combination comprising:

a first member reciprocally movable between initial and final positions for intermittently transporting a web, said first member having a first claw at one end thereof provided with a leading tip surface for engaging a first groove in said web;

a second member supported by said first member for movement between extended and retracted positions, and having a second claw provided with a leading tip surface for engaging a succeeding second groove in said web and assisting in the transport of said web by said first member;

first means for moving said first member between said initial and final positions; and

second means for moving said first member when said first member is positioned in its final position causing said first claw to be removed from said first groove while allowing said second claw to move while in said second groove away from said first claw to its extended position in which the distance between said leading tip surfaces of said first and second claws is greater than said normal pitch of said grooves, and for moving said first member when said first member is returned to its initial position causing said first claw to move into said second groove and said second claw into a succeeding third groove, and further moving while in its third groove to its retracted position, in which the distance between said leading tip surfaces of said first and second claws and the distance between said second and third grooves are both equal to said normal pitch whereby said claws are in position to transport said web a distance equal to said normal pitch upon movement of said first member to its final position.

B 508,940

VEHICLE FUEL SYSTEM

John T. Risse, and James C. Taggart, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 24, 1974, Ser. No. 508,940
Int. Cl.² F02M *37/00*
U.S. Cl. 137—255 **4 Claims**

References Cited
UNITED STATES PATENTS

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1,776,877	9/1930	Yonkese	244/135 C
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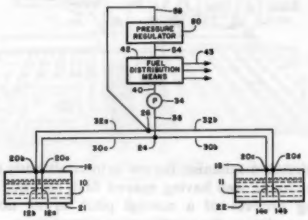
2,773,556	12/1956	Meyers et al.	137/255 X
2,901,031	8/1959	Powell et al.	123/139 AW
3,026,928	3/1962	Phillips et al.	123/139 AW
3,771,504	11/1973	Woods	123/139 AW
3,789,819	2/1974	Moulds	123/139 AW

FOREIGN PATENTS OR APPLICATIONS

44-25685	1/1969	Japan	137/255
98,679	7/1921	Switzerland	137/255



1. A self-regulating fuel level equalizing system for internal combustion engines of vehicles comprising a plurality of spaced apart fuel tanks, feed conduits having about equal length, about equal inner diameter, and about equal fuel flow restriction and having lower portions with open ends each disposed at about the same level for automatic preferential fuel withdrawal from the fuller of said tanks, housed within and extending from lower portions of each of said tanks through an upper portion of each of said tanks and devoid of external bottom connections with said tanks and each coupled to a fuel pump, a fuel pump for preferentially withdrawing fuel from the fuller of said tanks through said feed conduits and supplying at least a portion of said fuel to a said engine, distribution means for feeding said fuel from said fuel pump to said engine, return conduits separate from said feed conduits having about equal length, about equal inner diameter, and about equal fuel flow restriction, and having lower portions with open ends each disposed at about the same level in said tanks for automatic preferential fuel return to the less full of said tanks, housed within and extending from lower portions of each of said tanks through and upper portion of each of said tanks and coupled to said fuel pump for preferentially returning any unused portion of said withdrawn fuel to the less full of said tanks, said preferential fuel withdrawing and returning automatically coacting to maintain an about equal fuel level in said fuel tanks.

B 509,474

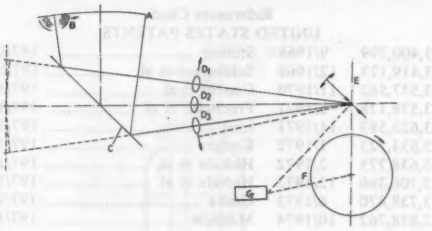
IMPROVEMENTS IN OR RELATING TO SCANNING LENS SYSTEMS FOR ELECTROSTATIC COPYING MACHINES

Nandor Mihalik, Walton-on-Thames, and Terence Cunningham Frostick, London, both of England, assignors to Gestetner Byfleet Limited, London, England

Filed Sept. 26, 1975, Ser. No. 509,474
Claims priority, application United Kingdom, Oct. 2, 1973, 46011/73
Int. Cl.² G03G *15/04*
U.S. Cl. 355—8 **12 Claims**

References Cited
UNITED STATES PATENTS

3,740,137	6/1973	Sato	355/66



1. A copying machine including a platen; a surface for the platen for supporting an object to be copied; a rotatable drum; a photo-conductive surface for said drum for receiving an image of an object supported on the platen; a mirror positioned below and spaced from the platen and inclined with respect thereto; a lens mounted for movement along an arcuate path about an axis and constrained to have that axis intersecting the optical axis of the lens, to scan the image reflected in the mirror of an object on the platen; and a second mirror on and mounted for rotation about, the axis of rotation of the lens to reflect light passing from the lens onto the photoconductive surface of the drum; and wherein the first said mirror is dimensioned and inclined with respect to the platen so that substantially the whole of the perpendicular projection of said surface of the platen falls on said first mirror.

B 511,909

METHOD AND APPARATUS FOR MEASURING A PHYSICAL PROPERTY OF A FLUID MATERIAL THAT VARIES NONLINEARLY RELATIVE TO THE DENSITY OF THE FLUID

William B. Banks, Rte. 1, Box 172, Chappell Hill, Tex. 77426

Filed Oct. 3, 1974, Ser. No. 511,909
Int. Cl.² G01N *9/36*
U.S. Cl. 73—61.1 R **13 Claims**

References Cited
UNITED STATES PATENTS

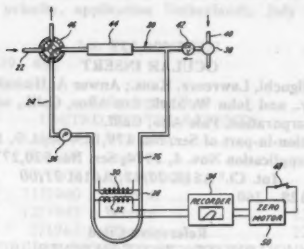
3,310,974	3/1967	Banks	73/1 R
3,449,940	6/1969	Banks	73/32 R
3,678,734	7/1972	Mitchell	73/61.1 R

1. The method of measuring a physical property of a fluid material that varies nonlinearly relative to the density of the fluid comprising,

measuring the density of the fluid,

injecting a predetermined amount of a second miscible fluid having a density different from the density of the first

fluid into a predetermined amount of the first fluid, and measuring the density of the combined fluids whereby the



differences in the two measurements is an indication of the physical property of the first fluid.

B 512,324

GRATING WITH PUSH BARS FOR AN INCINERATOR

Lucien Delaplace, Sevres, France, assignor to Stein Industrie, Velizy Villacoublay, France

Filed Oct. 4, 1974, Ser. No. 512,324
Int. Cl.² F23G *5/00*; F22B *1/22*
U.S. Cl. 110—8 R **10 Claims**

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UNITED STATES PATENTS

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3,055,320	9/1962	Bolda	110/8 X
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FOREIGN PATENTS OR APPLICATIONS

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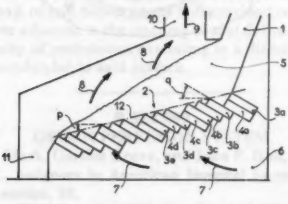

1. A grating for an incinerator of combustible waste comprising a plurality of parallel juxtaposed bars disposed transversely in the incinerator and extending lengthwise thereof to provide a support surface on which waste is advanced in the course of combustion thereof, said bars being arranged in two sets alternating with one another, the bars of one set being fixed and the bars of the second set being reciprocally movable, the bars of said one set being secured in successive gradually lowered positions in the incinerator to provide a downward inclination of about 15° with the horizontal in the lengthwise direction of advancement of the waste, said bars of both sets being inclined with the horizontal at an angle of about 30° in a direction opposite said downward inclination in the lengthwise direction.

B 515,216

APEX SEAL DEVICE FOR USE IN ROTARY PISTON ENGINE

Yasumi Ooba, No. 5106 Hoshigaoka Apartment, 268-4 Hoshigaoka, Nishiokacho, Toyota, Aichi, Japan

Filed Oct. 16, 1974, Ser. No. 515,216
Claims priority, application Japan, Mar. 28, 1974, 49-35734[U]
Int. Cl.² F16J *15/48*
U.S. Cl. 277—81 P **2 Claims**

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UNITED STATES PATENTS

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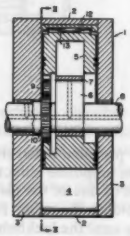


1. In a rotary piston engine of the type comprising a rotor, an apex seal groove provided in a crest portion of said rotor, a rotor housing, and an apex seal device, the improvement comprising:

an apex seal movably located within said apex seal groove in the radial and rotational directions, said seal having a bottom surface inclined to a horizontal plane making a right angle to the radius direction in relation to said apex seal, said apex seal further having an interstice between the leading side wall of said apex seal and the inside wall of said apex seal groove opposite to the leading side wall of said apex seal; and

an apex seal spring confined between the bottom surface of said apex seal groove and said bottom surface of said apex seal.

B 516,537

SINGLE OPERATION-TRIPLE CYCLE LOCKBOLT SETTING DEVICE AND SYSTEM

Louis A. Champoux, Seattle, and Hollis B. Merrell, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 21, 1974, Ser. No. 516,537
Int. Cl.² B21J *15/00*, *15/22*, *15/12*
U.S. Cl. 72—391 **13 Claims**

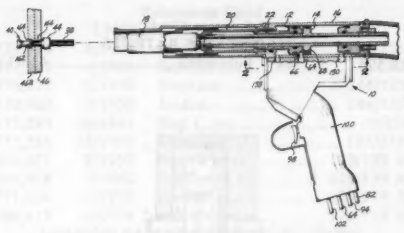
References Cited
UNITED STATES PATENTS

3,309,911	3/1967	Simmons	72/391
3,475,945	11/1969	Chirco	72/391
3,645,125	2/1972	Summerlin	72/391
3,698,231	10/1972	Davis	72/391
3,792,933	2/1974	Stencel	72/391

1. A lockbolt setting apparatus having a nose piece for grasping a pintail of a bolt and an anvil for swaging a collar to the bolt wherein the apparatus comprises: a housing having a stand off to provide clearance to the collar to permit seating a lockbolt without exerting pressure on the collar; a first piston connected to the anvil to provide sliding movement of the anvil within the housing; a second piston connected to the nose piece to provide sliding movement of the nose piece within the structure of the anvil; and means for sequencing

and powering the apparatus to first, move the second piston to seat the bolt, second, to move the first piston in the opposite direction to swage the collar, third, to move the second piston an additional amount to break off the pintail of the bolt, and fourth, to move both pistons back to the original position.

11. A method of setting lockbolts with the steps comprising: providing clearance for a collar positioned on a lockbolt; grasping a pintail of the lockbolt with puller jaws; introducing



hydraulic fluid under pressure between a pair of pistons for moving the pistons in opposite directions and seating the lockbolt by movement of one of the pistons that is connected to the puller jaws; holding the other piston, connected to a swaging die, stationary until the lockbolt is seated; swaging the collar onto the seated lockbolt by advancing the swaging die; breaking off the pintail by further movement of the puller jaws; and returning both of the pistons to the starting position.

B 519,599

METHOD AND AN APPARATUS FOR CLEAVING SLAUGHTERED CARCASSES

Martin Rudolf Ekstam, Kristianstad, Sweden, assignor to AB Stathmos, Jonkoping, Sweden

Filed Oct. 31, 1974, Ser. No. 519,599

Claims priority, application Sweden, Dec. 8, 1973, 7315142

Int. Cl.² A22B *5/20*

U.S. Cl. 17—23 **11 Claims**

References Cited

UNITED STATES PATENTS

3,074,102	1/1963	Hotard	17/23
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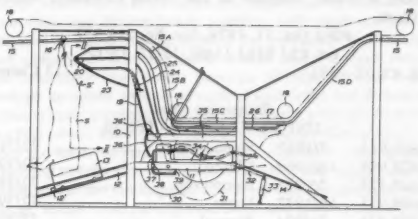

1. An improved method of cleaving slaughtered carcasses, the cleaving operation taking place essentially centrally by sawing through the spine while pulling the carcass forward lying on the back, the improvement consisting in that the two halves of the carcass obtained from the cleaving operation are moved apart and guided in such a way that the lower portion of each half is tipped inwardly while its upper portion is moved outwardly in order that the spine portion remaining in each carcass half may be pressed outwardly on the inside of the carcass half and become accessible for cutting by means of a saw while removing the smallest possible quantity of adjacent muscles above and below the spine portion.

B 520,277

OCULAR INSERT

Takeru Higuchi, Lawrence, Kans.; Anwar A. Hussain, Lexington, Ky., and John W. Shell, Los Altos, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 179,129, Sept. 9, 1971. This application Nov. 4, 1974, Ser. No. 520,277

Int. Cl.² A61K *27/12*; A61M *31/00*

U.S. Cl. 128—260 **13 Claims**

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UNITED STATES PATENTS

3,113,076	12/1963	Jacobs	424/15
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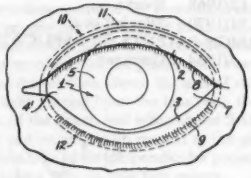

1. In a non-corneal, drug dispensing ocular insert comprising a flexible body containing a drug for application to the eyeball to dispense said drug to the eye over a prolonged period of time, the improvement comprising a means for permitting facile insertion into and comfortable retention within the eye, and concomitantly preventing the expulsion of the insert therefrom, wherein said flexible body comprises an annular ring that is sized relative to the eye so it can be placed about the eyeball and in contact therewith, completely posterior to the sulcus sclerae and within the upper and lower cul de sacs, the width of the ring being such that the ring is virtually invisible in the palpebral fissure when the eyelids are open.

B 520,534

DEVICE FOR SPREADING GRANULES

Jan Oosterhof, Weesp, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 385,648, Aug. 6, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,534

Claims priority, application Netherlands, July 7, 1972, 7209463

Int. Cl.² A01C *7/02*

U.S. Cl. 239—652 **3 Claims**

References Cited

UNITED STATES PATENTS

156,688	11/1874	Workman	239/650
657,419	9/1900	Jager	239/650
714,051	11/1902	Spitzenberg	239/653
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3,142,421	7/1964	Sieracki	222/567 X

FOREIGN PATENTS OR APPLICATIONS

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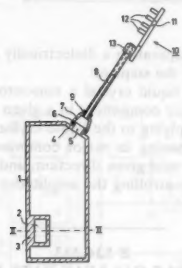

1. A hand portable combination granular container and spreader comprising a container provided with bottom, top and side wall portions and a downward projecting tubular member located at one of said side wall portions, a downwardly projecting delivery tube detachably coupled into said tubular member and a granule distributer adjustably attached to the end of said delivery tube, said distributer comprising a substantially flat plate having a major axis substantially parallel to the axis of said delivery tube and provided on the surface of said plate adjacent to the opening of said delivery tube, with a multiplicity of protrusions extending in a direction substantially perpendicular to said surface.

B 522,009

ORGAN PERFUSION SYSTEM

Robert A. Clark, Garden Grove, and John P. Hall, Irvine, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Nov. 8, 1974, Ser. No. 522,009

Int. Cl.² B01F *3/04*

U.S. Cl. 62—306 **7 Claims**

References Cited

UNITED STATES PATENTS

3,406,531	10/1968	Swenson et al.	62/306
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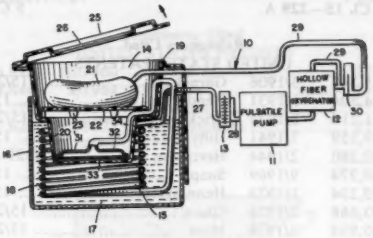
3,729,948	5/1973	Schwartz	62/64
3,777,507	12/1973	Burton et al.	62/306
3,810,367	5/1974	Peterson	62/457

1. An organ perfusion system comprising a chamber adapted to support an organ requiring perfusion, a pulsatile pump, a heat exchanger, and conduit means connecting the chamber, pump, and exchanger for the circulation of cold perfusate through an organ supported within the chamber, wherein the improvement comprises

said heat exchanger including a container for holding ice water and a cooling coil of tubular thermally-conductive material therein, said coil being connected in circuit with



said pump and perfusion chamber for cooling perfusate circulated therethrough, said pulsatile pump being disposed downstream of said heat exchanger and upstream of said perfusion chamber for drawing cold perfusate from said coil and pumping the same in a series of regular pulses to an organ supported within said chamber.

B 523,080

NOISE DOSEMETER

Daniel Haig-Arbib, London, England, assignor to National Research Development Corporation, London, England

Filed Nov. 12, 1974, Ser. No. 523,080

Claims priority, application United Kingdom, Nov. 13, 1973, 52630/73

Int. Cl.² G01H *3/12*

U.S. Cl. 73—557 **13 Claims**

References Cited

UNITED STATES PATENTS

3,747,703	7/1973	Knowd et al.	73/558 X
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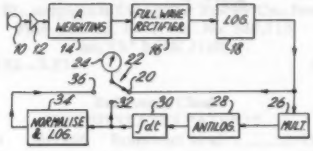

1. A noise dosemeter including

a transducer for providing an electrical signal representative of the amplitude of sound waves incident thereon,

first circuit means for providing a signal representative of the logarithm of an input signal thereto, the first circuit means being coupled to the transducer,

multiplier means for providing a signal representative of a predetermined multiple of the output signal from the first circuit means,

second circuit means for providing a signal representative of the anti-logarithm of the output signal of the multiplier means, and

integrating means for integrating the output signal of the second circuit means.

B 523,885

WET MOP CONSTRUCTION HAVING PILE FABRIC MOPPING ELEMENT

John Walter Crofton, La Grange, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 14, 1974, Ser. No. 523,885
Int. Cl.² A47L *13/20*
U.S. Cl. 15—229 A **5 Claims**

References Cited
UNITED STATES PATENTS

815,343	3/1906	Garnet	15/209 R
1,804,504	5/1931	Henderson	15/247
2,011,214	8/1935	Erickson	15/209 R
2,249,559	7/1941	Hilty	15/247
2,342,280	2/1944	Hertzberg	15/229 AP X
3,469,274	9/1969	Snapp	15/228
3,633,234	1/1972	Henningsen	15/114
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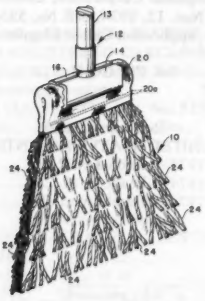
Flyer of the O'Cedar Mop Corp. entitled "Every-Which Way Mops" (Form W-1,4-55) 2246 W. 49 St. Chicago, Ill. received 6/24/55 in Patent Office.



1. A wet mop construction comprising a mop head having a flexible pile fabric main body of generally trapezoidal shape with opposite parallel sides of unequal length and opposite non-parallel sides extending in flared relation therebetween, said main body pile fabric comprising a relatively dimensionally stable base sheet having water-absorbent pile yarns attached to said sheet and being disposed to extend outwardly from opposite faces of the trapezoidal shaped main body, and a headband extending along and attached to the shorter parallel side of said pile fabric main body; and support means grippingly engaging only the headband of said mop head while leaving the pile fabric main body thereof free from supporting contact by support means to thereby position said main body in flexible, free-hanging, flaring relation from said support means.

B 527,054

LIQUID CRYSTAL DISPLAY

Donald Jones Channin, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 25, 1974, Ser. No. 527,054
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **17 Claims**

References Cited
UNITED STATES PATENTS

3,551,026	12/1970	Heilmeier	350/160 LC X
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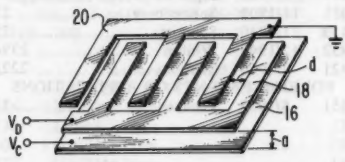


1. A method of operating a dielectrically anisotropic liquid crystal comprising the steps of:

applying to the liquid crystal a non-zero electric field Ey having its major component in a given direction;

concurrently applying to the liquid crystal a non-zero electric field Ex having its major component in a direction orthogonal to said given direction; and

independently controlling the amplitudes of the Ex and Ey fields.

B 534,333

VARIABLE GAS LEAK RATE VALVE

Errol P. Eernisse, and Gary D. Peterson, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research & Development Administration, Washington, D.C.

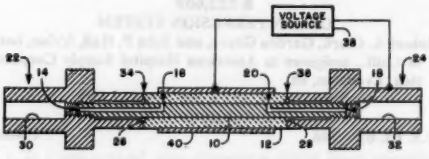
Filed Dec. 19, 1974, Ser. No. 534,333
Int. Cl.² F16K *31/02*
U.S. Cl. 251—129 **4 Claims**

References Cited
UNITED STATES PATENTS

3,465,732	9/1969	Kattchee	251/129 X
3,614,486	10/1971	Smiley	251/129 X

FOREIGN PATENTS OR APPLICATIONS

1,106,133	5/1961	Germany	251/129



1. A variable gas leak rate valve comprising an elongated metallic rod having first passageway extending from one end of said rod to an opening in its outer surface intermediate the rod ends and a second passageway extending from the other end of said rod to an opening in its outer surface spaced from said first passageway opening; a piezoelectric sleeve fitted in gas tight relationship around a portion of said rod intermediate said passageway openings, said sleeve being poled in the radial direction and normally blocking gas flow between said openings; an electrode disposed on the outer surface of said sleeve coextensive with said gas tight portion; means for seal-

ing the ends of said sleeve to end portions of said rod; and means for coupling voltage bias between said rod and said electrode to effect communication between said passageways through the interface between said rod and said sleeve.

B 543,078

WATER COOLING SYSTEM FOR A SHAFT TYPE FURNACE

Horst Euler, Rumeln-Kaldenhausen, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany

Filed Jan. 22, 1975, Ser. No. 543,078

Claims priority, application Germany, Jan. 26, 1974, 2403741

Int. Cl.² F28F *27/00*

U.S. Cl. 165—13 **9 Claims**

References Cited

UNITED STATES PATENTS

3,059,913	10/1962	Sands	165/107 X
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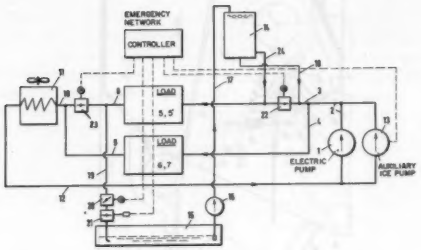

1. In a water cooling system for shaft furnaces, such as blast furnaces, comprising a closed circuit, a water cooling device located in said closed circuit, a first storage tank located below said closed circuit, at least one electric pump located in said closed circuit for circulating the cooling water, a second storage tank located above said closed circuit, and a pipe connecting said second storage tank to said closed circuit for maintaining a constant water pressure in said closed circuit, wherein the improvement comprises that said closed circuit includes a first feed line for cooling one portion of the shaft furnace and a second feed line disposed in parallel with said first feed line for cooling another portion of the shaft furnace, valve means in said first feed line for separating it from the flow through said closed circuit and said valve means arranged to operate automatically in a power failure affecting said at least one electric pump circulating the cooling water through said closed circuit, pipe means connecting said first feed line to said first and second storage tanks for providing flow from said second storage tank through said first feed line to said first storage tank when said first feed line is separated from said closed circuit, and an emergency pump located in said closed circuit and arranged to operate when a power failure occurs for circulating the cooling water through said second feed line in said closed circuit, said water cooling device located in said closed circuit spaced from said first feed line so that the cooling water passes through said water cooling device when a power failure occurs.

B 544,034

SHAFT SEAL ASSEMBLY

Carl H. Geary, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 24, 1975, Ser. No. 544,034

Int. Cl.² F16J *15/16, 15/44*

U.S. Cl. 277—27 **7 Claims**

References Cited

UNITED STATES PATENTS

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3,561,773	2/1971	Baumann	277/71
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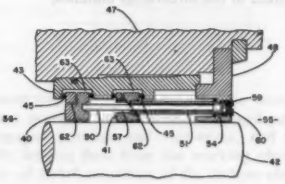


1. In a shaft seal assembly of the type wherein a high pressure fluid is passed between the shaft and at least one bushing encompassing the shaft, the assembly including

a series of circumferentially spaced beams substantially aligned axially with the shaft, the beams being secured against movement at one end and supporting the bushing in coaxial alignment about the shaft at the opposite end,

said beams having a high spring constant in the axial direction to prevent the bushing from being displaced axially by the high pressure fluid and having a relatively lower spring constant in the radial direction to permit the bushing to move radially in compliance with the shaft as the shaft is deflected, and

adjusting means operatively associated with the beams for adjusting the axial position thereof.

B 548,719

TRANSMISSION CONTROL SYSTEM WITH IMPROVED MODULATING VALVE

Charles E. Holzinger, Peoria, and William W. Blake, Kewanee, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 10, 1975, Ser. No. 548,719

Int. Cl.² B60K *21/00*

U.S. Cl. 192—3.57 **6 Claims**

References Cited

UNITED STATES PATENTS

3,137,311	6/1964	Rohweder et al.	192/109 F
3,468,194	9/1969	Horsch et al.	192/109 F
3,882,980	5/1975	Blake	192/3.57

1. A hydraulic transmission control circuit for selectively actuating at least one of a plurality of speed ratio clutches with hydraulic fluid at a first pressure and for selectively actuating one of a plurality of directional clutches at a second differential pressure, comprising

a fluid source,

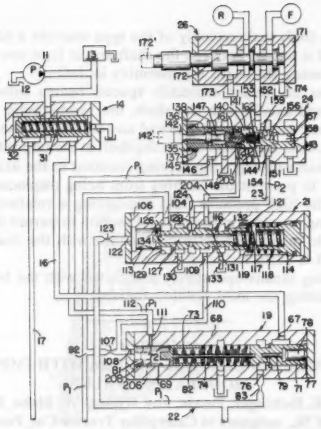
a speed ratio selector valve for communicating fluid at the first pressure to one of the speed ratio clutches,

a directional selector valve for communicating fluid at the second differential pressure to one of the directional clutches,

a differential valve in communication with the fluid source, the differential valve including means for communicating hydraulic fluid at the second differential pressure to the directional selector valve,

a first hydraulically responsive pressure modulating valve in communication with the source and the differential valve for modulating hydraulic fluid at the first pressure, and

a manually controlled modulating valve for communicating fluid at the second differential pressure from the differential valve to the directional selector valve, the manually controlled modulating valve including means for selectively modulating the second differential pressure into discrete operating modes in order to provide precise regulation of clutch engagement under different operating conditions, said two discrete operating modes being characterized by the selective modulating means in the manual modulating valve being operable to vary the second differential pressure at two different rates of modulation in order to selectively regulate the degree of engagement in the directional clutches,



the manually controlled modulating valve also including first relief means in communication with the first pressure modulating valve to selectively adjust the first fluid pressure during selective modulation of the second differential pressure by the manually controlled modulating valve,

the manually controlled modulating valve also including second relief means also in communication with the first pressure modulating valve for selectively providing relatively unrestricted communication between the first pressure modulating valve and a fluid drain in order to condition the first pressure modulating valve for establishing the first fluid pressure at a minimum level in order to facilitate subsequent modulation of both the first and second fluid pressures.

B 563,301

DEVELOPING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING MACHINES

Werner Salger, Hamburg-Langenhorn, Germany, assignor to Lumoprint Zindler KG, Hamburg, Germany

Filed Mar. 31, 1975, Ser. No. 563,301

Claims priority, application Germany, Apr. 9, 1974, 2417188

Int. Cl.² G03G *15/08*

U.S. Cl. 118—637 9 Claims

References Cited

UNITED STATES PATENTS

2,705,199	3/1955	Clark	118/637
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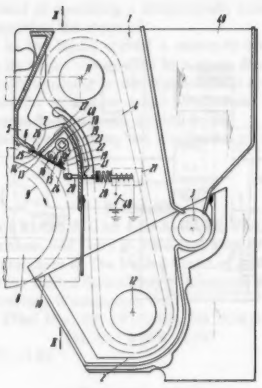
3,062,094	11/1962	Mayo	355/11
3,146,688	9/1964	Clark et al.	118/637
3,223,548	12/1965	Clark et al.	427/20



1. A developing device for electro-photographic copying machines, comprising a developing powder reservoir, a distribution hopper, a supply of developing powder in the lower region of the developing powder reservoir, said distribution hopper being positioned at a higher level than the developing powder supply, conveyor means to move through the developing powder reservoir and to carry developing powder from the supply to the distribution hopper, means defining a slot-type aperture in the distribution hopper a rotatable image transfer element below the aperture, said aperture extending over at least the axial length of said image transfer element with upper and lower longitudinal edges lying in a plane inclined at an angle to the horizontal, a plate-type shutter co-operable with the aperture and mounted for sliding movement in order selectively to close and open said aperture, control means coupled to the shutter for effecting movement thereof, support means arranged between the control means and the shutter, said support means being provided at the side of the lower longitudinal edge of the aperture, said longitudinal edge forming a guide means for the sliding shutter, and the leading edge of the shutter in the closing movement of the shutter moving in an upwards path.

B 541,464

FLUID CLUTCHES

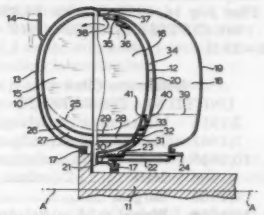
John E. Becker, Bowmanville, Canada, assignor to Cluaran Associates Limited, Oshawa, Canada

Filed Jan. 16, 1975, Ser. No. 541,464
Int. Cl.² F16D 33/04
U.S. Cl. 60—349 8 Claims

References Cited
UNITED STATES PATENTS

2,270,545	1/1942	Neracher et al.	60/350
2,359,930	10/1944	Miller	60/350
3,237,409	3/1966	Becker	60/351

1. A fluid clutch comprising power input and power output means, a pump element and a turbine element connected respectively to the power input and power output means for rotation thereby and providing respectively cooperating pump and turbine chambers rotatable about the same axis and constituting a working chamber, a quantity of working liquid in the working chamber, each element comprising a respective annular shell and a respective set of radially-extending vortex producing vanes, the pump element comprising another annular shell axially spaced from and rotatable with the respective element shell to form a corresponding stall reservoir compartment therebetween, at least some of the vanes of the pump element being connected by a respective connecting member which is mounted for movement within the stall reservoir compartment for movement of the vanes or vane portions connected thereto into and out of vortex-producing operative cooperation with the set of turbine vanes, means connected to



the said connecting member for moving the movable pump vanes or vane portions from a clutch-engaged position to a clutch-disengaged position and vice-versa, and means for automatically feeding fluid from the working chamber upon the existence of a stall condition of the turbine element relative to the pump element.

CHEMICAL APPLICATIONS

B 54,859

THIOPHOSPHITES AND ULTRAVIOLET LIGHT STABILIZER FOR OLEFIN POLYMERS

George J. McNally, West Orange, N.J., assignor to Weston Chemical Corporation, Montvale, N.Y.

Filed July 14, 1970, Ser. No. 54,859

Int. Cl.² C08K *5/13, 5/34, 5/49*

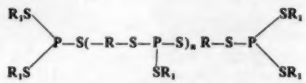
U.S. Cl. 260—23 H **2 Claims**

References Cited

UNITED STATES PATENTS

2,736,737	2/1956	Morris	260/928
3,016,363	1/1962	Tholstrup et al.	260/45.8
3,210,319	10/1965	Huhn et al.	260/45.8
3,239,484	3/1966	Stark	260/45.9
3,244,667	4/1966	Burgess	260/45.75
3,278,483	10/1966	Wright et al.	260/45.85
3,356,770	12/1967	Larrison	260/930
3,424,715	1/1969	Kopacki et al.	260/45.9
3,496,128	2/1970	Casey et al.	260/23
3,666,837	5/1972	Rattenbury	260/928
3,692,879	9/1972	Rattenbury et al.	260/928

1. Organic material normally susceptible to deterioration due to the effects of ultraviolet light containing a stabilizingly effective quantity of an admixture of (1) an ultraviolet light stabilizer selected from the group consisting of a benzotriazole and either nickel bis (octylphenyl) sulfide or 2,2′-thiobis-(4-t-octylphenolate) n-butylamine nickel, (2) a thiophosphite of the group consisting of



where *n* is zero or an integer, R is divalent alkylene of at least 2 carbon atoms, cycloalkylene, arylene, alkyleneoxyalkylene having 2 to 8 carbon atoms in each alkylene group, alkylenethioalkylene having 2 to 8 carbon atoms in each alkylene group, alkylene (polyoxyalkylene) having 2 to 3 carbon atoms in each alkylene group and 2 to 3 oxygen atoms, R_1 is alkyl, haloalkyl, aryl, haloaryl, alkenyl, aralkyl, haloalkenyl or cycloalkyl, said thiophosphite being present in an amount sufficient to enhance the stabilizing effect of said ultraviolet light stabilizer, (3) a metal salt stabilizer selected from the group consisting of barium, strontium, calcium, cadmium, zinc, lead, tin, magnesium, cobalt, nickel, titanium and aluminum salts of an acid selected from the group consisting of phenols, fatty acids having 6 to 18 carbon atoms, ricinoleic acid, naphthenic acid, epoxy fatty acids and aromatic carboxylic acids and (4) a phenolic antioxidant.

B 354,959

AGENTS FOR IMPROVING WET FASTNESS PROPERTIES

Hellmuth Pantke, Leichlingen, and Karl Vogel, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 27, 1973, Ser. No. 354,959

Claims priority, application Germany, Apr. 27, 1972, 2220710

Int. Cl.² D06P *5/02*

U.S. Cl. 8—74 **16 Claims**

References Cited

UNITED STATES PATENTS

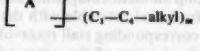
2,328,900	9/1943	Grimm	8/74 X
3,232,695	2/1966	Robin	8/165
3,764,262	10/1973	Hildebrand et al.	8/169

OTHER PUBLICATIONS

Gagliardi, American Dyestuff Reporter, Jan. 1962, pp. 31–40.

1. Agents for improving the wet fastness properties of dyeings of cellulose materials with direct dyes and of dyeings produced on synthetic polyamides with acid dyes, cationic dyes or disperse dyes from organic water immiscible solvents comprising the organic water immiscible solvent soluble adduct of *a*, *b* and *c* wherein

a is a customary wet fastness improving agent selected from the group consisting of condensation products of formaldehyde with dicyandiamide, quanidine or dicyandiamide and guanidine; polyethylene polyamines; alkylated polyethylene polyamines; condensation products of formaldehyde and hydroxydiarylsulfones; co-condensation products of dihydroxydiarylsulfones, aromatic sulfonic acids and formaldehyde; and the alkali metal or ammonium salt of the condensation product of the condensation product of aromatic sulfonic acids and formaldehyde having the formula



wherein

A is diphenyl ether radical;

m is a whole number from 0 to 2; and

n is a number from 0.5 to 2;

b a surface-active amine or amine oxide which contains at least one C_{12}–C_{28}-alkyl or alkenyl radical which is directly attached or is attached via a phenyl, benzyl or —CO–NH-alkylene- bridging member to the amino or amine oxide nitrogen atom; and *c* an anionic surface-active agent.

B 364,797

PRECOAT FOR PERMEABILITY SEPARATION SYSTEMS

William Maxwell Conn, La Mesa, Calif., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation of Ser. No. 153,789, June 16, 1971, abandoned. This application May 29, 1973, Ser. No. 364,797

Int. Cl.² B01D *13/00*

U.S. Cl. 210—23 H **13 Claims**

References Cited

UNITED STATES PATENTS

2,367,557	1/1945	Atwood	210/75 X
2,470,202	5/1949	Wickenden	210/75 X
2,600,085	6/1952	vanDyk	210/75 X
3,101,318	8/1963	Watson et al.	210/75 X
3,373,056	3/1968	Martin	210/23 X
3,462,362	8/1969	Kollsman	210/23
3,490,590	1/1970	Davies	210/23 X
3,537,988	11/1970	Marcinkowsky et al.	210/23

1. In the treatment of raw sewage containing hydrophobic and greasy materials by passage through an ultrafiltration

membrane such that there will be fouling of the membrane, the method of operation to preclude fouling thereof which comprises depositing upon said membrane a mixed coating of a solid adsorbent and a solid absorbent in a quantity of about 6 to 60 grams per 1,000 square feet of membrane, and passing through said coating a feed consisting essentially of the raw sewage, prior to contact of said feed with the membrane, to remove the membrane-fouling hydrophobic and greasy materials from said raw sewage.

B 383,697

BETAINIC AZO DYESTUFFS CONTAINING COBALT IN COMPLEX UNION WITH A COLORLESS, TRIDENTATE LIGAND

Paul Lienhard, Riehen near Basel; Fabio Beffa, Basel, and Charles Soiron, Riehen near Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 57,017, June 9, 1970, abandoned, which is a division of Ser. No. 496,651, Oct. 15, 1965, abandoned. This application July 30, 1973, Ser. No. 383,697

Int. Cl.[2] C09B *45/20*, *45/30*; D06P *3/24*

U.S. Cl. 260—147 **7 Claims**

References Cited

UNITED STATES PATENTS

2,814,614	11/1957	Zickendraht	260/145 B
2,826,573	3/1958	Strobel et al.	260/147
3,030,353	4/1962	Kuster	260/147
3,051,696	8/1962	Dettwyler	260/147
3,538,073	11/1970	Mack et al.	260/150 X

1. A betainic cobalt complex dyestuff of the formula

wherein the symbol

represents a member selected from the group consisting of diethylenetriamine, dipropylenetriamine and monoethylene-mono-propylene-triamine, said triamines being unsubstituted or N-lower alkyl-substituted,

α,β,γ-triaminopropane,
α,β,δ-triaminobutane,
α,γ-diamino-β-(aminomethyl)-propane,
N,N-bis-(β-phenylaminoethyl)-N-ethylamine,
N,N''-dibenzyldiethylenetriamine,
N,N-bis-(β-N'-piperidinoethyl)-N-ethylamine,
1-amino-2-(β-amino-ethylamino)-cyclohexane,
2,2'-diaminodicyclohexylamine,
1-amino-2-(β-amino-ethylamino)-benzene,
2,2'-diamino-diphenylamine,
2,6-(di-2'-pyridyl)-pyridine,
8-(2'-amino-phenylamino)-quinoline,
(2-pyridylmethylene-aminoethyl)-diethylamine,
1-(diethylamino)-2-(2'-pyridyl-methylene-amino)-benzene,
1-(dimethylamino)-2-(2'-pyridyl-methylene-amino)-cyclohexane,
2-(2'-pyridyl-methylene-amino-methyl)-pyridine,
8-(2'-pyridyl-methyleneamino)-quinoline,
2,6-bis-(benzyl-aminomethylene)-pyridine,
2,6-bis-(aminomethyl)-pyridine,
pyridine-2,6-dialdehyde dioxime,
pyridine-2,6-dialdehyde-dihydrazone,
2-methoxy-4,6-dihydrazino-1,3,6-triazine and
2-amino-4,6-dihydrazino-1,3,5-triazine; and

wherein

—D—N=N—E— is the divalent radical of a dyestuff selected from a benzene-azo-benzene dyestuff, a benzene-azo-naphthalene dyestuff, a benzene-azo-(1-phenyl-5-hydroxy-pyrazole) dyestuff, a benzene-azo-(1-phenyl-5-amino-pyrazole) dyestuff, a benzene-azo-acylacetophenylamide dyestuff, a benzene-azo-benzene-azo-naphthalene dyestuff, a naphthalene-azo-naphthalene dyestuff and a naphthalene-azo-(1-phenyl-5-hydroxy-pyrazole) dyestuff, any substituents of said dyestuffs being selected from hydrogen, chlorine, brome, lower alkyl, lower alkoxy, nitro, hydroxyl, lower-alkyl-sulfonyl, phenylsulfonyl, methylphenylsulfonyl, methyphenylsulfonylamino, methylsulfonylamino, acetylamino, carbo-ethoxy-amino, a radical of the formula

wherein

R_1 represents hydrogen, lower alkyl, hydroxyethyl, phenyl or lower alkylphenyl and R_2 represents hydrogen, lower alkyl or hydroxyethyl; carboxylic acid-N-phenylamide and lower alkyl carbonyl, phenoxycarbonyl, phenylazo or naphthylazo; and wherein one $-SO_3^-$ group is attached to either D or E;

X is linked in ortho-position to the azo bridge to a ring carbon atom of D and represents —O—, —COO— or lower-alkylsulfonamido, and

X' is linked in ortho-position to the azo bridge to a ring carbon atom of E and represents —O—, —N—(lower alkyl)—, —N—(hydroxy-lower-alkyl), —N—(phenyl)— or —NH—, said dyestuff being capable of forming a bicyclic metal complex with cobalt;

and wherein said lower alkyl and lower alkoxy moieties have from one to five carbon atoms.

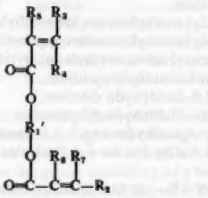
B 385,483
MONOMERIC COMPOUNDS

William R. Dunnavant, Columbus, Ohio; Edward M. Harris, Webster Groves, Mo.; Philip F. Kurz; Richard A. Markel, both of Columbus, Ohio, and Edward H. Parker, Ballwin, Mo., assignors to Wester Litho Plate & Supply Co., St. Louis, Mo.

Division of Ser. No. 173,661, Aug. 20, 1971, Pat. No. 3,799,915. This application Aug. 3, 1973, Ser. No. 385,483
Int. Cl.² C07C *101/46*
U.S. Cl. 260—471 R 11 Claims

References Cited
OTHER PUBLICATIONS
Finar, I. L. *Organic Chemistry*, Vol. I (1931), pub. by Richard Clay & Co., Great Britian pp. 200 – 202 relied on.

1. A compound represented by the general formula:



wherein R_1' is selected from the group consisting of alkylene, haloalkylene, alkoxyalkylene, aminoalkylene, cycloalkylene, aralkylene, cycloalkylalkylene and aryloxyalkylene groups, R_2 is selected from the group consisting of substituted or unsubstituted aryl groups wherein the substituents are selected from the group consisting of alkyl, methoxy, chloro, bromo and nitro, R_3, R_4 and R_5 are each selected from the group consisting of hydrogen, halogen and lower alkyl, and R_6 and R_7 are each selected from the group consisting of hydrogen, halogen, nitro, lower alkyl, phenyl, phenoxy, and lower alkoxy.

B 402,553
HIGH PURITY POLONIUM RECOVERY

Clyde H. H. Chong, Miamisburg; Calvin M. Love, Dayton; Martin D. Prisc, Bellbrook, all of Ohio, and Alexander J. Russo, Milpitas, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 1, 1973, Ser. No. 402,553
Int. Cl.² C01F *13/00*
U.S. Cl. 423—249 4 Claims

References Cited
UNITED STATES PATENTS

2,873,170	2/1959	Hyde et al.	423/2
2,894,817	7/1959	Karraker	423/2
3,758,663	9/1973	Kirby	423/2

1. A method for providing a radioactive heat source element comprising contacting polonium containing polonium-210 with from about 4 to about 8 normal nitric acid to form a nitric acid solution containing from about 4 to about 7 curies of polonium-210 per milliliter of solution, adding a base to said solution to adjust the pH of said solution to from about 8 to about 9pH thereby precipitating polonium hydroxide having the formula $Po(OH)_4 \cdot xH_2O$, immediately cooling said solution and said precipitate, filtering said cooled precipitate within from about 2 to about 3 minutes in from about 10 to about 20 micron filter element, passing a heated inert gas through said filter element thereby drying said precipitate, heating said filter element to about 900°C in a vacuum of less than about 10^{-4} Torr to vaporize said polonium, and thereafter condensing said vaporized polonium in a heat source element.

B 411,471
BRASS ALLOY

Günther Rudolph, Neuberg; Erhard Schelzke, Neu-Isenburg, and Antonio Leogrande, Werdohl, all of Germany, assignors to Vereinigte Deutsche Metallwerke AG, Frankfurt am Main, Germany

Filed Oct. 31, 1973, Ser. No. 411,471
Claims priority, application Germany, Nov. 2, 1972, 2253690
Int. Cl.² C22C *9/04*
U.S. Cl. 75—156.5 5 Claims

References Cited
UNITED STATES PATENTS

3,158,470	11/1964	Burghoff et al.	75/157.5 X

OTHER PUBLICATIONS
Bridgeport Brass Technical Handbook, Sept. 1949, Bridgeport Brass Co., Conn., pp. 64 and 65.
Metals and Alloys, 1950, Chemical Pub. Co., N.Y., p. 51.

1. A brass alloy with improved machinability consisting essentially of 57 to 62% by weight copper, 1 to 4% by weight lead, 0.15 to 0.20% by weight magnesium, 0.15 to 0.20% by weight tin and the balance zinc.

B 414,028
HIGH STRENGTH GRAPHITE AND METHOD FOR PREPARING SAME

Lyle G. Overholser, Oak Ridge; David R. Masters, Knoxville, and John M. Napier, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 8, 1973, Ser. No. 414,028
Int. Cl.² C01B *31/04*
U.S. Cl. 423—448 7 Claims

References Cited
UNITED STATES PATENTS

3,174,895	3/1965	Gibson et al.	264/29
3,407,038	10/1965	Beasley	423/448
3,552,533	1/1971	Nitz et al.	423/448
3,718,720	2/1973	Lambdin et al.	423/448
3,720,575	3/1973	Cowlard	264/29
3,728,423	4/1973	Shaffer	264/29
3,790,393	2/1974	Cowland et al.	264/29

FOREIGN PATENTS OR APPLICATIONS

1,569,267	10/1970	Germany	423/448

5. A precursor composition for the manufacture of graphite products in which mixtures of particulate carbonizable filler materials and carbonizable organic binders are formed into the desired article configuration and heated in an inert atmosphere to graphitization temperatures, said graphite precursor composition comprising a particulate filler of a thermoplastic material coked at a temperature in the range of 400° to 1000°C. and of a particle size less than 100 mesh, a thermoplastic binder in a size range of less than 70 mesh and in a concentration of about 18 to 25 weight per cent of the mixture, and green organic carbonizable fibers in a maximum concentration of not more than 2 weight per cent of the particulate filler.

B 423,365
STORAGE-STABLE EPOXIDE MOULDING COMPOSITIONS

Bruno Schreiber, Basel, and Hermann Diethelm, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 7, 1973, Ser. No. 423,365

Claims priority, application Switzerland, Dec. 14, 1972, 18262/72

Int. Cl.² C08L *63/00, 63/06*

U.S. Cl. 260—37 EP **5 Claims**

References Cited

UNITED STATES PATENTS

3,409,591	11/1968	Landuo et al.	260/2 N
3,459,713	8/1969	Saran et al.	260/77.5 NC
3,505,262	4/1970	Freyhold et al.	260/2 EP
3,538,184	11/1970	Heer	260/830 TW
3,625,918	12/1971	Heer et al.	260/830 TW
3,704,281	11/1972	Saran et al.	260/77.5 NC
3,810,785	5/1974	Dominic et al.	260/2 EC X

FOREIGN PATENTS OR APPLICATIONS

6,714,294	5/1968	Netherlands	260/77.5 NC

OTHER PUBLICATIONS

Chemical Abstracts, por. 72:32700f. (Nov. 1969).

1. Storage-stable, rapidly curing epoxide moulding compositions, characterised in that they contain

a. adducts, containing epoxide groups, from triglycidyl isocyanurate and cyclohexylamine or alkyl substituted cyclohexylamine,

b. adducts, containing amino groups, from cycloaliphatic or heterocyclic diamines and diglycidyl compounds, as curing agents and

c. inorganic or organic, pulverulent or fibrous fillers with the resin and curing agent pre-adducts softening between 45° and 120°C, melting 5° – 30°C above the softening point and being present in the moulding compositions predominantly in the form of discrete particles wherein components (a) and (b) are present in about equivalent amounts.

B 426,802
9-(4-PIPERIDYLIDENE)THIOXANTHENES

Anthon Ebnöther, Arlesheim, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 308,300, Nov. 20, 1972, abandoned. This application Dec. 20, 1973, Ser. No. 426,802

Int. Cl.² C07D *335/20*

U.S. Cl. 260—293.57 **21 Claims**

References Cited

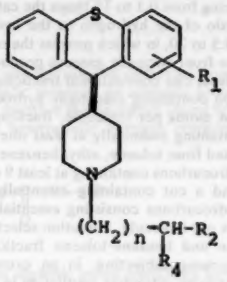
UNITED STATES PATENTS

3,055,903	9/1962	Renz et al.	260/293.4
3,275,640	9/1966	Engelhardt et al.	260/293.4
3,408,355	10/1968	Renz et al.	260/293.4
3,470,188	9/1969	Kaiser et al.	260/293.4

FOREIGN PATENTS OR APPLICATIONS

518,974	3/1972	Switzerland

1. A compound of the formula:



wherein

n is 0 or an integer from 1 to 3,

R_1 is hydrogen, chlorine, bromine, fluorine, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 3 carbon atoms or alkylthio of 1 to 3 carbon atoms,

R_2 is cyano, a $—COR_3$ or $—COOR_3$ group, wherein R_3 is alkyl of 1 to 4 carbon atoms, and

R_4 is hydrogen or alkyl of 1 to 4 carbon atoms,

in free base form, or in pharmaceutically acceptable acid addition salt form.

B 430,157
PROCESS FOR MANUFACTURING AND SEPARATING FROM PETROLEUM CUTS AROMATIC HYDROCARBONS OF HIGH PURITY

Bernard Juguin; Georges Cohen, both of Rueil-Malmaison, and Paul Mikitenko, Chatou, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jan. 2, 1974, Ser. No. 430,157

Claims priority, application France, Jan. 10, 1973, 73.00806

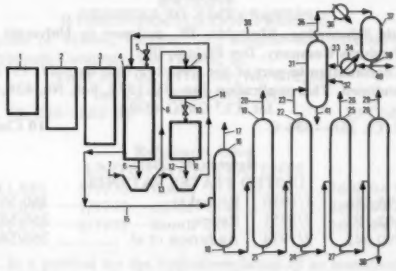
Int. Cl.² C07C *5/36*

U.S. Cl. 260—668 D **7 Claims**

References Cited

UNITED STATES PATENTS

2,834,822	5/1958	Worthington et al.	208/313
2,877,173	3/1959	Thorne et al.	208/96
2,969,317	1/1961	Hess	208/96
3,551,327	12/1970	Kelly et al.	208/313



1. A process for producing aromatic hydrocarbons in which a feed charge containing essentially paraffinic and naphthenic hydrocarbons and aromatic hydrocarbons is subjected to a treatment with hydrogen in at least two reaction zones in the presence of a catalyst, the inlet temperature of at least the last reaction zone traversed by the charge being from 570° to

600°C, the pressure from 1 to 60 kg/cm², the hourly flow rate by volume being from 0.1 to 10 times the catalyst volume and the molar ratio of the hydrogen to the hydrocarbons being from about 0.5 to 20, in which process the obtained products are made free from normally gaseous products and then subjected to at least one conventional fractionation so as to obtain a fraction containing essentially hydrocarbons having 4 and 5 carbon atoms per molecule, fractions or mixtures of fractions containing essentially at least one aromatic hydrocarbon selected from toluene, ethyl-benzene and xylenes, and aromatic hydrocarbons containing at least 9 carbon atoms per molecule, and a cut containing essentially, in addition to saturated hydrocarbons consisting essentially of 6 and/or 7 carbon atoms per molecule, a fraction selected from the benzene, toluene and benzene-toluene fractions, said process further comprising subjecting, in an extractive distillation zone, said cut to an extractive distillation in the presence of a suitable extraction solvent, recovering at the bottom of the extractive distillation column a mixture of the extraction solvent and at least one aromatic hydrocarbon, separating said aromatic hydrocarbon from the extraction solvent and recovering, at the top of the extractive distillation zone, a new cut containing non-aromatic products, said process further comprises subjecting said new cut containing the non-aromatic hydrocarbons consisting essentially of saturated hydrocarbons having 6 and/or 7 carbon atoms per molecule to a condensation, removing therefrom at least the major part of the extraction solvent contained therein and recycling at least one portion of the so-purified cut containing the said non-aromatic hydrocarbons towards the last one of the reaction zones, wherein the inlet temperature is comprised between 570° and 600°C, the catalyst of at least said reaction zone, to which said so-purified cut is recycled, containing at least two metals from group VI B, VII B or VIII of the periodic classification of elements, the concentration of each metal being comprised between 0.01 and 5% by weight.

B 438,484

PREPARATION OF KETONES

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 212,753, Dec. 27, 1971, abandoned. This application Jan. 31, 1974, Ser. No. 438,484

Int. Cl.² C07C *45/02*

U.S. Cl. 260—586 C **10 Claims**

References Cited

UNITED STATES PATENTS

2,495,286	1/1950	Brubaker	260/597 T
2,562,393	7/1951	Reppe	260/586 C
3,790,643	2/1974	Anderson et al.	260/586 R

1. A process for the preparation of a ketone which comprises reacting a hydrocarbon selected from the group consisting of saturated and alkylaromatic hydrocarbons with an olefinic hydrocarbon in the presence of carbon monoxide, anhydrous or aqueous hydrogen chloride and an organic peroxy free radical catalyst at a temperature at least as high as that necessary to generate free radicals, and recovering the resultant ketone.

B 451,308

PROCESS FOR PREPARING FILAMENTS, FIBERS AND SHEETS OF AROMATIC POLYAMIDES

Peter Eckardt, Hofheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 14, 1974, Ser. No. 451,308

Claims priority, application Germany, Mar. 17, 1973, 2313308

Int. Cl.² C08G *69/44*

U.S. Cl. 260—78 S **3 Claims**

References Cited

UNITED STATES PATENTS

3,063,966	11/1962	Kwoleck et al.	260/78
3,079,219	2/1963	King	264/184
3,300,450	1/1967	Clay	264/344
3,642,706	2/1972	Morgan	264/184
3,767,756	10/1973	Blades*	264/184
3,775,361	11/1973	Jensen	264/184
3,796,693	7/1974	Morgan et al.	264/184
3,819,587	6/1974	Kwoleck	260/30.2

FOREIGN PATENTS OR APPLICATIONS

1,420,681	10/1968	Germany	260/78

1. In a process for the preparation of filaments, fibers and sheets of essentially aromatic polyamides comprising the steps of pre-condensing aromatic diamines and dicarboxylic acid halides to a conversion of from 80 to 98% in an amide-type solvent, neutralizing with ammonia the hydrogen halide formed in said pre-condensation step to form an ammonium halide of which a portion is soluble in said amide-type solvent, separating the insoluble portion of the ammonium halide formed in said neutralization step, adding further quantities of dicarboxylic acid halide to the reaction mixture and post-condensing them to complete the condensation reaction, neutralizing the hydrogen halide formed in said post-condensation step and spinning the resulting solution; the improvement which comprises adding to the reaction solution after separation of the insoluble portion of said ammonium halide and prior to said post-condensation step an inorganic base, the halide of which is soluble in said amide-type solvent, causing said added inorganic base to react with the dissolved portion of said ammonium halide to release ammonia, removing the ammonia thus set free and thereafter carrying out said post-condensation step until the desired degree of polymerization is obtained.

B 452,938

RESINS FOR SEPARATING HEAVY METALS CONSISTING OF THIOUREA-GROUP-CONTAINING MACROPOROUS VINYL AROMATIC CROSSLINKED MATRIXES

Herbert Corte, Opladen; Harold Heller, Cologne; Michael Lange, and Otto Netz, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Mar. 20, 1974, Ser. No. 452,938

Claims priority, application Germany, Mar. 24, 1973, 2314756; Dec. 22, 1973, 2364368

Int. Cl.² C08F *27/02*

U.S. Cl. 75—101 BE **16 Claims**

References Cited

UNITED STATES PATENTS

2,890,180	6/1959	Cerny et al.	260/79.5 NV
3,847,481	11/1974	Motani et al.	260/2.2 R
3,892,688	7/1975	Motani et al.	260/2.2 R
3,892,689	7/1975	Motani et al.	260/2.2 R

FOREIGN PATENTS OR APPLICATIONS

2,312,233	4/1973	Germany

1. A thiourea group containing synthetic resin comprising a crosslinked macroporous vinyl aromatic matrix polymer of monovinyl and polyvinyl monomers, said polymer comprising

from 50 to 99% by weight of polymerized monovinyl monomer and from 1 to 50% by weight of polymerized polyvinyl monomer and having a pore volume of from 20 to 80% by volume, a specific surface of 10 to 500 m^2/g and having at least 10% of its aromatic nuclei substituted by from 1 to 3 functional groups of the formulae

(I) $-[(CH_2)_n-NR_1-\underset{\underset{S}{\|}}{C}-NR_2R_3]_x$,

(II) $-[(CH_2)_n-NR_1H]_y$

and

(III) $-[(CH_2)_n-NR_1-\underset{\underset{S}{\|}}{C}-NR_1-(CH_2)_n]-_z$

wherein X, Y and Z are separately 0, 1, 2 or 3; *n* is 0, 1 or 2; R_1, R_2 and R_3 are separately hydrogen, alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, cycloalkyl having 5 to 6 carbon atoms, phenyl, naphthyl, benzyl or one of said phenyl, naphthyl or benzyl radicals substituted by alkyl or alkoxy having 1 to 3 carbon atoms or halogen; the proportion of (I) being from 1 to 95%, the proportion of (II) being from 98 to 4% and the proportion of (III) being from 1 to 95% when X, Y and Z are other than 0 and the proportion of (I) being from 5 to 100% and the proportion of (II) being from 95 to 0% when Z is O, said proportional percentages being based on the sum of the total functional groups.

16. A process for absorbing mercury, gold, silver and platinum compounds or mixtures thereof from solution which comprises employing the synthetic resin of claim 1.

B 457,547
THERMOGRAPHIC RECORDING PROCESS

Urbain Leopold Laridon, Wilrijk; Albert Lucien Poot, Kontich, and Jozef Frans Willems, Wilrijk, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Apr. 3, 1974, Ser. No. 457,547

Claims priority, application United Kingdom, Apr. 4, 1973, 16166/73; June 19, 1973, 29073/73

Int. Cl.² B41M *5/12, 5/18*

U.S. Cl. 427—145 **11 Claims**

References Cited

UNITED STATES PATENTS

2,129,242	9/1938	Sheppard et al.	117/36.8
2,663,657	12/1953	Miller et al.	117/36.8
3,108,896	10/1963	Owen	117/36.8
3,819,382	6/1974	Konig et al.	96/114.1
3,839,041	10/1974	Hiller	96/114.1 X

FOREIGN PATENTS OR APPLICATIONS

1,127,344	4/1962	Germany
1,129,151	5/1962	Germany

1. A recording process, which comprises exposing to a heat pattern a support carrying an organic reducing compound corresponding to one of the following general formulae:

$$R_2-\underset{\underset{O}{\|}}{C}-N(R_1)-OH \qquad (I)$$

wherein:

R_1 represents hydrogen, an aliphatic group containing up to about four carbon atoms; and R_2 represents an alkoxy group containing up to 18 carbon atoms, an aryloxy group, an amino group of the formula

$$-N(R_3)(R_4)$$

in which R_3 and R_4 (same or different) represent hydrogen, an aliphatic group or an aromatic group, or R_3 and R_4 represent together the necessary atoms to close a 5- or 6-membered heterocyclic nitrogen containing nucleus; and

$$R_5-\underset{\underset{O}{\|}}{C}-NH-OH \qquad (II)$$

wherein:

R_5 represents an aliphatic group containing up to 18 carbon atoms, an aromatic group or a 5- or 6-membered heterocyclic group; and a reducible noble metal salt of an aliphatic carboxylic acid, said organic reducing compound being present in an effective amount to reduce said noble metal salt and said heat pattern having a temperature of at least about 60°C and sufficient to initiate said reduction.

B 471,116
PREPARATION OF N-CHLOROFORMYL-CARBAMIC ACID AMIDES AND ESTERS

Artur Botta, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 416,569, Nov. 16, 1973. This application May 17, 1974, Ser. No. 471,116

Claims priority, application Germany, Nov. 22, 1972, 2257344

Int. Cl.² C07C *127/19*

U.S. Cl. 260—544 C **2 Claims**

References Cited

UNITED STATES PATENTS

3,832,389	8/1974	Koenig et al.	260/544 C

FOREIGN PATENTS OR APPLICATIONS

6,910,960	1/1971	Netherlands	260/544 C
2,008,116	9/1971	Germany	260/544 C

OTHER PUBLICATIONS

Helfert, et al., Angew. Chem. Internat. Edit., Vol. 9, (1970), 372–373.

1. The compound N-chloroformyl - N-phenyl-N'-(β-chloroethyl)-N'-methylurea.

B 472,241
HYDROFORMYLATION PROCESS

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 22, 1974, Ser. No. 472,241

Int. Cl.² C07C *45/08, 29/02*

U.S. Cl. 260—604 HF **13 Claims**

References Cited

UNITED STATES PATENTS

3,511,880	5/1970	Booth	260/604 HF
3,555,098	1/1971	Olivier et al.	260/604 HF
3,641,076	2/1972	Booth	260/604 HF

1. In a method for the hydroformylation of an unsaturated compound which comprises reacting a C_3 to C_{18} alkene with carbon monoxide and hydrogen in the presence of a catalyst comprising cobalt hydrocarbonyl wherein the hydrocarbonyl contains from about 1 to about 20 carbon atoms or a complex between cobalt, carbon monoxide and a tertiary organo phosphine wherein the number of carbons in the tertiary organo phosphine group does not exceed 30 at a temperature in the range of from about 75°C to about 300°C, and a pressure of

from about 1 atmosphere to about 500 atmospheres, and recovering the resultant hydroformylation product, the improvement which consists in effecting the hydroformylation in the presence of a promoter comprising an ester of carbonic acid selected from the group consisting of ethylene carbonate, propylene carbonate, diphenyl carbonate, dialkyl carbonate wherein the alkyl groups contain from 2 to 10 carbon atoms and phenyl alkyl carbonate wherein the alkyl group contains 2 to 10 carbon atoms.

B 461,184

FIRE RETARDANT THERMOPLASTIC POLYMER COMPOSITIONS

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 308,881, Nov. 22, 1972, Pat. No. 3,819,770, which is a division of Ser. No. 49,204, June 23, 1970, Pat. No. 3,725,509. This application Apr. 15, 1974, Ser. No. 461,184

Int. Cl.² C08L *51/00, 53/00*

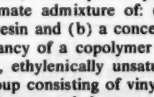
U.S. Cl. 260—876 R **8 Claims**

References Cited

UNITED STATES PATENTS

3,194,795	7/1965	Friedman	260/45.7 P
3,227,696	1/1966	Flowers et al.	260/85.7
3,255,276	6/1966	Winter et al.	260/897
3,489,706	1/1970	Mikofalvy	260/29.6 MP
3,544,509	12/1970	Carroll et al.	260/45.7 P
3,819,770	6/1974	Kraft et al.	260/898

1. A fire retardant, thermoplastic polymer composition, comprising an intimate admixture of: (a) an acrylonitrile-butadiene-styrene resin and (b) a concentration effective to provide fire retardancy of a copolymer of: (1) at least one halogen containing, ethylenically unsaturated monomer selected from the group consisting of vinyl halides, vinylidene halides, chlorinated syrenes, halogenated C_1–C_{18} alkyl acrylates and methacrylates and halo-substituted nitriles of ethylenically unsaturated carboxylic acids and (2) from about 2.5 to 99%, by weight, of at least one bis(hydrocarbyl) vinylphosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C_1–C_{18} alkyl and

wherein R and R′ are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint.

B 478,739

PAPERMAKING MACHINE HAVING A SUCTION ZONE FREE OF WIRE SUPPORTS

Christian Schiel, Heidenheim-Schnaitheim, Germany, assignor to J. M. Voith, GmbH, Heidenheim (Brenz), Germany

Filed June 12, 1974, Ser. No. 478,739

Claims priority, application Germany, June 20, 1973, 2331313

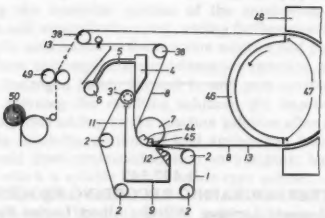
Int. Cl.² D21F *1/52, 9/02*

U.S. Cl. 162—290 **11 Claims**

References Cited

UNITED STATES PATENTS

2,881,671	4/1959	Thomas	162/301
3,079,990	3/1963	Taylor et al.	162/350
3,441,476	4/1969	Schiel	162/306
3,565,757	2/1971	Jordansson	162/301
3,694,311	9/1972	Skeppstedt	162/290
3,726,758	4/1973	Parker et al.	162/203 X



1. A papermaking machine having an endless machine wire and a breast roll about which the wire is entrained and a head box for supplying suspension to the wire in the region of the breast roll; an endless belt and a curved guide means both spaced from the breast roll and about which guide means both of said wire and belt are entrained in engagement with opposite sides of the sheet formed on said wire, said machine having means defining a formation zone between said breast roll and curved guide means wherein water drains through the wire from the suspension supplied to the wire, said formation zone on the side of the wire opposite the suspension side being free of wire supporting members which create pressure pulses in the suspension, said means defining the formation zone including suction box means beneath the wire opposite the suspension side of the wire and extending from the region of said breast roll at least to the region of said guide means, said suction box means including boundary walls at the ends and the sides of the formation zone, at least the side boundary walls terminating laterally at the side edges of the wire and being spaced a short distance downwardly from the wire.

B 479,175

PROCESS FOR THE PRODUCTION OF A DISPERSION OF CONDENSATION POLYMER PARTICLES CONTAINING A MODIFYING AGENT

Peter Francis Nicks, Maidenhead; Peter George Osborn, Bourne End; Morice William Thompson, Maidenhead, and Patricia Lesley James, Kingswinsford, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 13, 1974, Ser. No. 479,175

Claims priority, application United Kingdom, June 18, 1973, 28838/73

Int. Cl.² C08J *3/02, 3/20;* **C08K** *5/01, 5/02*

U.S. Cl. 260—33.6 R **12 Claims**

References Cited

UNITED STATES PATENTS

3,007,891	11/1961	Gerstenberg et al.	260/40 P
3,007,892	11/1961	Gruschke et al.	260/40 P
3,372,138	3/1968	Bowman et al.	260/40 P
3,383,352	5/1968	Duell et al.	260/33.6 R
3,433,753	3/1969	Farkas et al.	260/33.6 R
3,505,268	4/1970	Backhouse et al.	260/34.2
3,532,663	10/1970	Nicks et al.	260/34.2
3,759,864	9/1973	Nicks	260/40 R
3,879,335	4/1975	Storck et al.	260/34.2

1. A process for the production of a dispersion of condensation polymer particles in a hydrocarbon or chlorinated hydrocarbon liquid medium in which the polymer is insoluble, wherein the disperse particles of polymer are of a size from 0.1μ to 100μ and incorporate at least one modifying agent for the polymer, the process comprising heating in the said liquid medium at polymerisation temperature an appropriate condensation polymer-forming reactant or reactants, the reactant or at least one of the reactants being present as a liquid disperse phase in an emulsion of which the continuous phase is constituted by the said liquid medium and which is produced with the aid of from 1 to 10 percent by weight, based on the disperse phase, of an emulsifying agent which is a polymeric material containing in its molecule at least one chain-like component of a type which is soluble and non-self-associated in the liquid of the disperse phase and at least one chain-like component of another type which is soluble and non-self-associated in the liquid of the continuous phase, the average molecular weight of the individual components being at least 1,000, the total molecular weight of the individual components of each type being at least 3,000 or at least $n \times 1{,}000$ where n is the number of the individual components of the other type, and the ratio of the total weights of the individual components of the two types being from 3:1 to 1:3, in addition one of the chain-like components of the emulsifying agent which is soluble in a disperse phase being also capable of associating with the polymer produced, dispersing in the said liquid phase of the emulsion prior to completion of the polymer-forming condensation reaction the modifying agent or agents and then completing the polymer-forming reaction.

B 479,242

CERAMIC BINDER FOR POLYCONDUCTOR POWDERS

David Kahn, and Raymond James Geckle, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 14, 1974, Ser. No. 479,242

Int. Cl.² H01B *1/08*

U.S. Cl. 252—500 **3 Claims**

References Cited

UNITED STATES PATENTS

3,520,831	7/1970	Trap	252/500 X

FOREIGN PATENTS OR APPLICATIONS

744,947	8/1954	United Kingdom

OTHER PUBLICATIONS

Chemical Abstracts; Vol. 72, 16664s. "Semiconducting Glass Ceramics."

1. As an article of manufacture, a vanadium dioxide or doped vanadium dioxide in a ratio of 5 to 50 percent, and as a binder therewith, vanadium pentoxide and phosphorus pentoxide in admixture from 85% to about 50 percent of vanadium pentoxide on a mole basis, reminder phosphorus pentoxide, said binder intimately and strongly adhering to vanadium dioxide and said binder having voltage threshold for switching which extrapolated to 0 voltage is at approximately 68°C.

B 484,067

AMINO-SUBSTITUTED NITROIMIDAZOLYL-METHYLENEAMINOIMIDAZOLIDINONES

Clemens Rufer, and Hans-Joachim Kessler, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed June 28, 1974, Ser. No. 484,067

Claims priority, application Germany, July 7, 1973, 2335144

Int. Cl.² C07D *401/12, 401/14*

U.S. Cl. 260—240 A **8 Claims**

References Cited

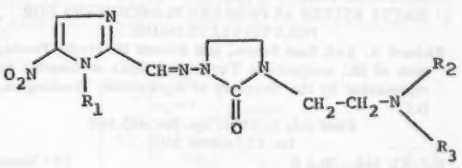
UNITED STATES PATENTS

3,752,809	8/1973	Rufer et al.	260/240 A
3,832,352	8/1974	Ilvespaa	423/273

OTHER PUBLICATIONS

Snyder et al., J. Med. Chem. 13 (1970), No. 4, p. 756–759.

1. An amino-substituted nitroimidazolylmethylene-aminoimidazolidinone of the formula



wherein R_1 is alkyl of 1–4 carbon atoms and $—NR_2R_3$ is dialkylamino wherein alkyl is of 1 to 4 carbon atoms, pyrrolidino, piperidino, morpholino or N-methylpiperazino, or a physiologically acceptable acid addition thereof.

B 485,051

PRODUCTION OF PYROMELLITIC DIANHYDRIDE

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 1, 1974, Ser. No. 485,051
Int. Cl.² C07D *307/89*
U.S. Cl. 260—346.4 10 Claims

References Cited
UNITED STATES PATENTS
3,723,516 3/1973 Muller et al. ..... 260/346.4 X
FOREIGN PATENTS OR APPLICATIONS
1,068,649 5/1967 United Kingdom

1. A process for the preparation of pyromellitic dianhydride which comprises

a. treating pseudocumene with propylene, said propylene being present in a stoichiometric excess, at a temperature of from about 0° to about 150°C and a pressure of from about 1 atmosphere to about 100 atmospheres in the presence of a catalyst comprising a Lewis acid, a mineral acid or a zero-valent molybdenum-carbon monoxide complex to product 2,4,5-trimethylcumene and diisopropyl-substituted pseudocumenes;

b. treating the resultant 2,4,5-trimethylcumene and diisopropyl-substituted pseudocumenes with an oxygen-containing gas in the presence of a catalyst comprising a vanadium-containing compound dispersed on an inorganic oxide support at a temperature of from about 100° to about 500°C and a pressure of from about 1 atmosphere to about 100 atmospheres;

c. decarboxylating the polycarboxylated treatment product at a temperature of from about 450° to about 600°C at atmospheric pressure or a temperature of from about 270°C to about 400°C at subambient pressures to produce pyromellitic dianhydride; and

d. recovering the resultant pyromellitic dianhydride.

B 485,060

DIACETAL DERIVATIVES OF POLYUNSATURATED FATTY ESTERS AS PRIMARY PLASTICIZERS FOR POLYVINYLCHLORIDE

Richard A. Awl, East Peoria, and Everett H. Pryde, Peoria, both of Ill., assignors to The United Sates of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 1, 1974, Ser. No. 485,060
Int. Cl.² C08K *5/10*
U.S. Cl. 260—30.4 R 10 Claims

References Cited
UNITED STATES PATENTS
3,787,459 1/1974 Frankel ..... 260/410.9 R
OTHER PUBLICATIONS
R. A. Awl, "Acetal Derivatives of Methyl 9(10) Formylstearate: Plasticizers for PVC", J. Amer. Oil Soc. 49(4), pp. 222–228, 1972.

4. In a plasticized poly(vinyl chloride) composition an improvement comprising a plasticizing amount of a primary plasticizer selected from the group consisting of methyl di(-dimethyl acetal) stearate, methyl tri(dimethyl acetal) stearate, and mixtures of the same.

B 489,331

STORAGE-STABLE, QUICK-CURING EPOXIDE RESIN MOULDING MATERIALS

Bruno Schreiber, Basel; Wolfgang Seiz, Pfeffingen, and Ewald Forster, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 257,799, May 30, 1972, abandoned.
This application July 17, 1974, Ser. No. 489,331
Claims priority, application Switzerland, June 25, 1971, 9351/71
Int. Cl.² C08L *91/00*
U.S. Cl. 260—28 P 14 Claims

References Cited
UNITED STATES PATENTS
3,288,747 11/1966 Sussman ..... 260/37 EP
3,409,591 11/1968 Landua et al. ..... 260/47 EN
3,454,421 7/1969 Westbrook ..... 260/47 EN X
3,533,985 10/1970 Lantz et al. ..... 260/37 EP
OTHER PUBLICATIONS
Lee et al.; Handbook of Epoxy Resins; McGraw–Hill Book Co.; 1967; pp. 8–15.

1. Storage-stable, one package quick-curing resin moulding materials consisting essentially of:

a. epoxide resin consisting essentially of an adduct containing free epoxide groups and formed from a low molecular weight epoxide resin and a polyamine,

b. pre-adducts containing free amino groups and formed from polyamines containing aromatic groups and a diepoxide, as curing agents, wherein the ratio of the number of the reactive hydrogen atoms of the polyamine on the amine nitrogen atoms to that of the epoxide groups of the epoxide is in the range of 3:1 to 5:1, and

c. mineral or organic pulverulent or fibrous fillers, with the epoxide resins and the curing agents softening between 45° and 120°C, and having a melting point higher by 5° to 30°C than the softening point, and the epoxide resins and curing agents being present in the moulding materials predominantly as discrete particles.

B 491,673

TREATMENT OF WASTE PAPER, ESPECIALLY TO EFFECT THE RECOVERY OF CLEAN FIBERS THEREFROM

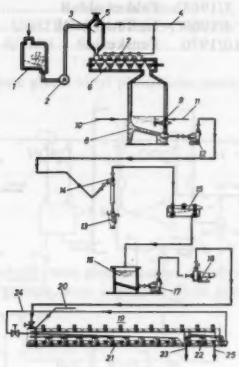
Heinz Lausch, Heidenheim (Brenz), Germany, assignor to J. M. Voith, GmbH, Heidenheim (Brenz), Germany

Filed July 25, 1974, Ser. No. 491,673
Claims priority, application Germany, Aug. 4, 1973, 2339591
Int. Cl.² D21C *5/02*; D21F *1/66*
U.S. Cl. 162—5 20 Claims

References Cited
UNITED STATES PATENTS
2,005,742 6/1935 Hines ..... 162/8 X
2,083,884 6/1937 Wells 162/5
3,245,868 4/1966 Espenmiller et al. ..... 162/191 X
3,248,277 4/1966 Gartner 162/5
3,440,134 4/1969 Murphy 162/8
3,441,130 4/1969 Sisson et al. ..... 162/55 X

1. A method of treating waste paper, especially for recovery of the fiber therefrom, which comprises; shredding the paper, conveying the shredded paper to a reaction zone while simultaneously admixing a treatment agent with the shredded paper up to about 7½ parts by weight of the agent to one part by weight of shredded paper, retaining the shredded paper treatment agent mixture in said reaction zone in the absence of the application of pressure and any significant increase in temperature for digestion of the shredded paper thereby to form a material in the form of a fibrous suspension, adding water to the said material prior to removal thereof from the reaction

zone, cleaning and deflaking the diluted material, then subjecting the cleaned diluted material to flotation to effect at



least partial separation of the fiber fraction thereof from the liquid fraction, and recovering at least said fiber fraction for reuse.

B 494,440

ABSORBENT ARTICLES MADE FROM CARBOXYLIC POLYELECTROLYTE SOLUTIONS CONTAINING BIS-OXAZOLINE CROSSLINKER AND METHODS FOR THEIR PREPARATION

James R. Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1974, Ser. No. 494,440
Int. Cl.² C08F *20/06*
U.S. Cl. 260—29.6 N **13 Claims**

References Cited
UNITED STATES PATENTS

3,669,103	6/1972	Harper et al.	128/156
3,755,237	8/1973	Isaacs	260/29.6 TA
3,812,070	5/1974	Kelley	260/29.6 TA

FOREIGN PATENTS OR APPLICATIONS

2,012,809	10/1971	Germany

1. A solution useful to form water swellable articles of a carboxylic synthetic polyelectrolyte which comprises
   1. a solvent consisting of water, or a mixture thereof with lower alcohols,
   2. about 5 to about 60% by weight based on the amount of solvent of a carboxylic polyelectrolyte or mixtures thereof having free carboxylic acid groups, and
   3. 0.05 to 5.0% by weight based on the polyelectrolyte of a bis-oxazoline or bis-imino-oxazolidino crosslinking agent reactive with carboxylic acid groups.

B 494,450

ABSORBENT ARTICLES MADE FROM LATEXES OF CARBOXYLIC SYNTHETIC POLYELECTROLYTE CONTAINING N-SUBSTITUTED ACRYLAMIDE CROSSLINKING AGENT

James Richard Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1974, Ser. No. 494,450
Int. Cl.² C08L *25/08*
U.S. Cl. 260—29.6 TA **4 Claims**

References Cited
UNITED STATES PATENTS

3,860,549	1/1975	Sekmakos	260/29.6 TA

1. A solution useful to form water swellable articles of a carboxylic synthetic polyelectrolyte upon curing which comprises
   1. a solvent selected from the group consisting of water, lower alcohols and mixtures thereof,
   2. about 5 to about 60 percent by weight based on (1) of a crosslinkable carboxylic copolymer which contains in the copolymer
      A. about 25 to about 98 percent by weight based on the total weight of the copolymer of an alkali metal salt of an olefinically unsaturated monocarboxylic acid;
      B. about 2 to about 50 percent by weight of an olefinically unsaturated monocarboxylic acid;
      C. about 25 to about 60 percent by weight of an alkyl ester of an olefinically unsaturated monocarboxylic acid and
      D. about 0.3 to about 5.0 percent by weight of crosslinking units of an N-substituted acrylamide or methacrylamide wherein the substituent group is an hydroxy methyl or an alkoxy methylene group having 1–8 carbons.

B 494,944

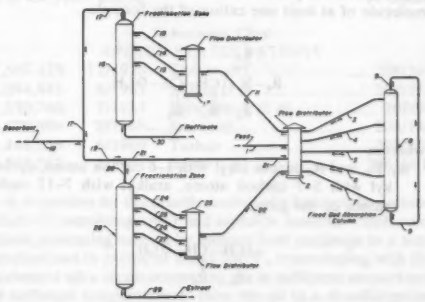
EFFLUENT FRACTIONATION IN SIMULATED MOVING-BED ADSORPTION PROCESSES

Clarence George Gerhold, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 5, 1974, Ser. No. 494,944
Int. Cl.² C07C *7/12, 7/13*
U.S. Cl. 260—274 SA **8 Claims**

References Cited
UNITED STATES PATENTS

2,576,525	11/1951	Lipkin	260/674
2,790,016	4/1957	Lanneau	260/674
3,510,423	5/1970	Neuzil et al.	208/310
3,636,121	1/1972	Stine et al.	260/674



1. In a process for the separation of hydrocarbons wherein:

i. a feed stream is passed into a fixed bed of a solid adsorbent which preferentially adsorbs one hydrocarbon species contained in the feed stream;

ii. an extract-rich effluent stream and a raffinate-rich effluent stream are withdrawn from the bed of solid adsorbent;

iii. the points at which the feed stream enters the bed of solid adsorbent and at which the effluent streams are withdrawn are periodically moved in a unidirectional pattern which simulates the utilization of a moving-bed of the adsorbent by shifting the location of the adsorption and desorption zones within the adsorption column; and,

iv. the effluent streams are passed into fractionation zones; the improvement which comprises passing each of the effluent streams through a flow distribution means which changes the locations at which the effluent stream enters the fractionation zone and effects a correlation of the composition of the effluent stream with the composition of the liquid contents of the fractionation zone at the respective location.

B 495,903

CONCENTRATED SOLUTIONS OF ANIONIC DYESTUFFS

Guenther Boehmke, Leverkusen; Werner Theuer, Opladen-Luetzenkirchen; Konrad Nonn, Leverkusen, and Georg Pape, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 8, 1974, Ser. No. 495,903

Claims priority, application Germany, Aug. 16, 1973, 2341293

Int. Cl.² D06P 3/14

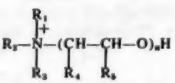
U.S. Cl. 8—84 **2 Claims**

References Cited

UNITED STATES PATENTS

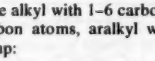
2,986,444	5/1961	Rokohl et al.	8/84
3,307,901	3/1967	Bindler et al.	8/84
3,446,569	5/1969	Braun et al.	8/84
3,529,922	9/1970	Berger et al.	8/84

1. Anionic dyestuffs which contain a carboxyl or sulfonic acid substituent and from 1 mole per dyestuff molecule to 1 mole equivalent per mole of the acid group in the dyestuff molecule of at least one cation of the formula



wherein

R_1, R_2, and R_3 denote alkyl with 1–6 carbon atoms, cycloalkyl with 5–7 carbon atoms, aralkyl with 7–12 carbon atoms, or the group:



wherein

R_4 and R_5 denote hydrogen, methyl or ethyl and n is a number from 1 to 20.

B 496,792

MOTOR FUEL BLENDING CONTROL SYSTEM

Walter A. Bajek, Lombard, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 12, 1974, Ser. No. 496,792

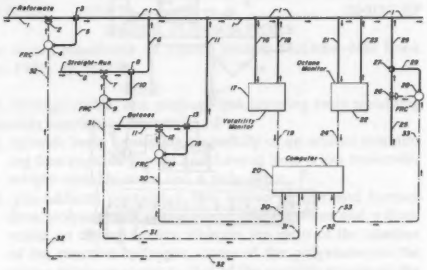
Int. Cl.² C10L 1/04, 1/10; G01N 33/00

U.S. Cl. 44—2 **9 Claims**

References Cited

UNITED STATES PATENTS

3,383,190	5/1968	Weber et al.	44/2
3,385,680	5/1968	Feld et al.	44/2
3,437,461	4/1969	Hoffman et al.	44/2
3,533,746	10/1970	Fenske	23/230 A



1. In a process for motor fuel blending, wherein two gasoline streams, having dissimilar octane ratings, are admixed and (i) a butane-rich stream is added for vapor pressure control, and (ii) a lead-containing compound is added to increase the octane rating of the motor fuel blend, the control system which comprises, in cooperative combination:

a. first flow-varying means for adjusting the flow rate of the gasoline stream having the higher octane rating;

b. second flow-varying means for adjusting the flow rate of the gasoline stream having the lower octane rating;

c. third flow-varying means for adjusting the flow rate of said butane-rich stream;

d. a first hydrocarbon analyzer receiving a sample of the blend of said butane stream, said higher octane gasoline stream and said lower octane stream, and developing a first output signal representative of a volatility characteristic of said sample;

e. a second hydrocarbon analyzer receiving a second sample of said blend, and developing a second output signal representative of the octane rating of said sample;

f. comparator means, receiving said first and Prepolymer output signals, which compares the rate of change thereof and the actual value of the octane rating of said blend, and generates third and fourth output signals;

g. fourth flow-varying means for adjusting the flow rate of said lead-containing compound added to said blend;

h. first signal-receiving means to which said third output signal is transmitted by said comparator means, said first signal-receiving means in turn transmitting to said fourth flow-varying means, whereby the flow of said lead-containing compound is adjusted in response to said octane rating; and,

i. second signal-receiving means to which said fourth output signal is transmitted by said comparator means, said second signal-receiving means in turn transmitting to said third flow-varying means whereby the flow of said butane stream is adjusted in response to said composition characteristic.

B 502,993

POLYALKYLENE GLYCOL VINYL PHOSPHATES

Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 389,607, Aug. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 63,262, Aug. 6, 1970, abandoned. This application Sept. 6, 1974, Ser. No. 502,993

Int. Cl.² C07F *9/11*; C08J *9/00*

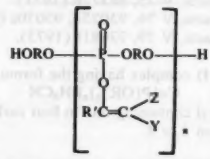
U.S. Cl. 260—929 7 Claims

References Cited

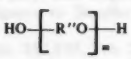
UNITED STATES PATENTS

3,819,750	6/1974	Shim	260/929

1. Polyalkylene glycol vinyl phosphates having the formula:



where R is a polyalkylene glycol residue obtained by removing two hydroxyl groups from a polyalkylene glycol having the formula



where R'' is an alkylene group of from 2 to about 20 carbon atoms, and m is from 2 to about 20, *n* is an integer from 1 to about 100, R' is selected from the group consisting of hydrogen, alkyl and haloalkyl, Z and Y are each selected from the group consisting of halogen, hydrogen and alkyl, provided Z and Y are not both hydrogen or alkyl.

B 503,742

PROCESS FOR THE PRODUCTION OF HALOGENATED AROMATIC PRIMARY AMINES

Masatomo Fujise, Wako; Yasuo Nakano, Tokyo, and Koji Isobe, Yono, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 6, 1974, Ser. No. 503,742

Claims priority, application Japan, Sept. 6, 1973, 48-100541

Int. Cl.² C07C *85/11*

U.S. Cl. 260—580 8 Claims

References Cited

UNITED STATES PATENTS

2,214,067	9/1940	Petersen	260/551 C UX
3,145,231	8/1964	Kosak	260/690 X

FOREIGN PATENTS OR APPLICATIONS

708,699	5/1954	United Kingdom	260/570.5
1,191,610	5/1970	United Kingdom	260/580

1. A process for the production of halogenated aromatic primary amines by catalytic hydrogenation of halogenated aromatic nitro compounds, which comprises hydrogenating a halogenated aromatic nitro compound in the presence both of Raney nickel and of a dehalogenation inhibitor selected from the group consisting of dicyandiamide, cyanamide and calcium cyanamide, in an inert solvent at a temperature in the range from 40° to 150°C under an elevated hydrogen pressure.

B 508,118

HYDROCRACKING PROCESS FOR THE MAXIMIZATION OF AN IMPROVED VISCOSITY LUBE OIL

Le Roi E. Hutchings, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 23, 1974, Ser. No. 508,118

Int. Cl.² C10G *41/00*, *13/06*, *37/02*

U.S. Cl. 208—59 5 Claims

References Cited

UNITED STATES PATENTS

3,308,055	3/1967	Kozlowski	208/111
3,444,071	5/1969	Langhout	208/59
3,463,724	8/1969	Langlois et al.	208/98
3,530,061	9/1970	Orkin et al.	208/60
3,562,149	2/1971	Bryson et al.	208/143
3,617,482	11/1971	Egan	208/59
3,617,484	11/1971	Thompson et al.	208/59
3,732,156	5/1973	Bennett et al.	208/111
3,793,191	2/1974	Billon et al.	208/59

1. A process of hydrocracking lube oil stocks to high viscosity index oils comprising subjecting a lube oil charge stock to hydrocracking conditions selected to minimize the formation of non-lube oil fractions in the presence of a first hydrocracking catalyst, fractionating the resulting hydrocracked lube oil stock to separate therefrom a light lube oil boiling below about 925° F. and a heavier lube oil boiling above about 925° F., subjecting said heavier lube oil in the presence of a second hydrocracking catalyst to more severe hydrocracking conditions than said charge stock to reduce the viscosity and improve the V.I. characteristics of the heavier lube oil, blending the thus improved heavier lube oil with said light lube oil, and recovering the resultant lube oil blend as the product of the process.

B 508,119

PROCESS FOR THE CONVERSION OF HYDROCARBONACEOUS BLACK OIL

Le Roi E. Hutchings, Mt. Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 23, 1974, Ser. No. 508,119

Int. Cl.² C10G *9/16*, *34/00*

U.S. Cl. 208—208 R 4 Claims

References Cited

UNITED STATES PATENTS

1,567,429	12/1925	Earl et al.	208/361
3,094,481	6/1963	Butler et al.	208/255
3,330,760	7/1967	Hirschbeck et al.	208/92
3,429,804	2/1969	Sze et al.	208/144
3,448,039	6/1969	Tarhan	208/255
3,565,787	2/1971	Bauer	208/48 R

1. A process for the desulfurization of a hydrocarbonaceous black oil containing sulfur and asphaltic material which comprises preheating said oil by indirect heat exchange to a temperature not in excess of about 550°F., commingling with the preheated oil a steam-containing gas in sufficient amount and of sufficient temperature to raise the oil to a desulfurization temperature of from about 600°F. to about 800°F., and contacting the thus heated oil at a hydrocarbon conversion conditions with a desulfurization catalyst.

B 509,640

TWO STAGE ACTIVATION OF FLUORIDED CHROMIUM-CONTAINING CATALYST

Benny E. Nasser, Jr., and Richard E. Dietz, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 26, 1974, Ser. No. 509,640
Int. Cl.² B01J 21/02, 27/06, 29/00
U.S. Cl. 252—432 12 Claims

References Cited
UNITED STATES PATENTS

3,007,905	11/1961	Bailey	252/458
3,692,697	9/1972	Kravitz et al.	252/441

1. A process for producing a catalyst comprising:
calcining a chromium-containing silicon-containing support;
cooling said thus calcined support and incorporating therewith a fluorine-containing compound; and
thereafter heating said support containing said fluorine-containing compound at a temperature within the range of 300° to 1000°F, which temperature is lower than the temperature used for said calcining.

B 517,858

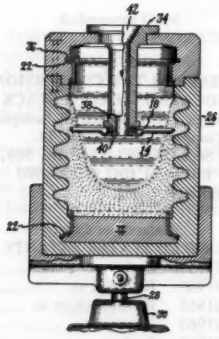
CENTRIFUGALLY CASTING HOLLOW GLASS BODY AROUND VAPOR SHIELD

John R. Lucek, and Vernon B. Palen, both of Pittsfield, Mass., assignors to General Electric Company, N.Y.

Division of Ser. No. 427,517, Dec. 27, 1973, abandoned. This application Oct. 25, 1974, Ser. No. 517,858
Int. Cl.² C03B 9/00, 7/00; C03C 27/02
U.S. Cl. 65—49 4 Claims

References Cited
UNITED STATES PATENTS

2,478,624	8/1949	De Vine	65/71 X
3,376,186	4/1968	Dovillard et al.	65/49 X
3,417,448	12/1968	Kelley	65/49 X
3,783,094	1/1974	Baum	65/302 X



1. A method of embedding a support ring in a vacuum envelope comprising a centrifugal mold, a ring member having an internal welding flange, a cap for said mold, said cap being provided with a ring holding means extending into said mold, said ring holding means holding said support ring within said mold, charging said mold with a predetermined quantity of glass, and rotating said mold to form a glass envelope said glass extending beyond the outer circumference of said ring and firmly embedding said ring in said glass.

B 518,656

PHOTOSENSITIVE COPPER (I) COMPLEXES

Henry J. Gysling, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 365,375, May 30, 1973, Pat. No. 3,860,500. This application Oct. 25, 1974, Ser. No. 518,656
Int. Cl.² C07F 1/08
U.S. Cl. 260—438.1 5 Claims

References Cited
UNITED STATES PATENTS

2,199,944	5/1940	van Peski et al.	260/438.1 X
2,909,544	10/1959	Birum	260/438.1
3,505,093	4/1970	Schultz	117/36.8

OTHER PUBLICATIONS

Chemical Abstracts, V 76, 46248j (1972).
Chemical Abstracts, V 75, 56372p (1971).
Chemical Abstracts, V 76, 93025u, 93030s (1972).
Chemical Abstracts, V 79, 73081t (1973).

1. A copper (I) complex having the formula

$$Cu[P(OR)_3]_nBH_3CN$$

wherein R is alkyl containing one to four carbon atoms and n is an integer from 1 to 3.

B 519,486

FIRE RETARDANT THERMOPLASTIC POLYMER COMPOSITIONS

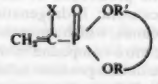
Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 333,595, Feb. 20, 1973, Pat. No. 3,857,906, which is a division of Ser. No. 49,204, June 23, 1970, Pat. No. 3,725,509. This application Oct. 31, 1974, Ser. No. 519,486
Int. Cl.² C08L 67/06
U.S. Cl. 260—873 8 Claims

References Cited
UNITED STATES PATENTS

3,755,498	8/1973	Dickason et al.	260/873
3,813,454	5/1974	Juelke et al.	260/873
3,855,352	12/1974	Moedritzer	260/873

1. A fire retardant, thermoplastic polymer composition comprising an intimate admixture of a polyester resin formed by condensation of a dibasic acid with a dihydric alcohol and an effective concentration to render said polymer composition flame retardant of a copolymer of:
1. at least one halogen containing, ethylenically unsaturated monomer selected from the group consisting of vinyl halides, vinylidene halides, chlorinated styrenes, halogenated C_1-C_{12} alkyl acrylates, and methacrylates and halo-substituted nitriles of ethylenically unsaturated carboxylic acids; and
2. from about 2.5 to 99%, by weight of at least one bis(hydrocarbyl) vinylphosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C_1–C_{18} alkyl and

wherein R and R′ are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint.

B 519,487

FIRE RETARDANT THERMOPLASTIC POLYMER COMPOSITIONS

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 333,595, Feb. 20, 1973, Pat. No. 3,857,906, which is a division of Ser. No. 49,204, June 23, 1970, Pat. No. 3,725,509. This application Oct. 31, 1974, Ser. No. 519,487

Int. Cl.² C08L *1/32*

U.S. Cl. 260—17 R **8 Claims**

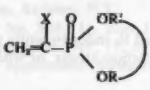
References Cited

UNITED STATES PATENTS

3,759,851	9/1973	Carl et al.	260/17.4
3,780,141	12/1973	Jin et al.	260/17 R X
3,792,113	2/1974	Goswami et al.	260/17.4 R X

1. A fire retardant, thermoplastic polymer composition comprising an intimate admixture of a cellulosic resin selected from the group consisting of cellulose esters and mixed esters and cellulose ethers and an effective concentration to render said polymer composition flame retardant of a copolymer of:

1. at least one halogen containing, ethylenically unsaturated monomer selected from the group consisting of vinyl halides, vinylidene halides, chlorinated styrenes, halogenated C_1-C_{12} alkyl acrylates and methacrylates and halo-substituted nitriles of ethylenically unsaturated caboxylic acids; and
2. from about 2.5 to 99%, by weight of at least one bis(hydrocarbyl) vinylphosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C_1-C_{18} alkyl and

wherein R and R′ are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint.

B 521,127

LINEAR(THERMOPLASTIC POLYESTERS AND PROCESS FOR THEIR MANUFACTURE

Lothar Buxbaum, Lindenfels, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,127

Claims priority, application Switzerland, Nov. 13, 1973, 15955/73

Int. Cl.² C08G *63/68*

U.S. Cl. 260—75 N **24 Claims**

References Cited

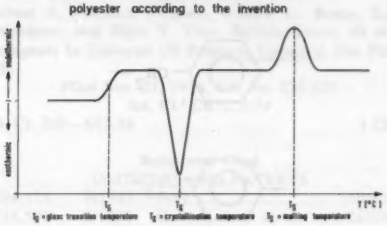
UNITED STATES PATENTS

2,925,405	2/1960	Laakso et al.	260/75 N
3,217,014	11/1965	Van Strien et al.	260/75 N
3,856,754	12/1974	Habermeier et al.	260/75 N
3,860,564	1/1975	Habermeier et al.	260/75 N

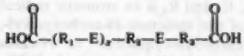
FOREIGN PATENTS OR APPLICATIONS

2,065,002	12/1971	Germany
2,218,229	11/1972	Germany

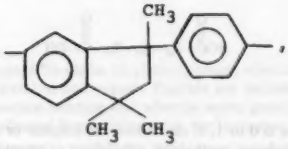
Graph of the thermogram of a thermoplastic polyester according to the invention



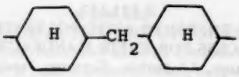
1. A linear, thermoplastic polyester with a high glass transition temperature and a relative viscosity of 1.1 to 4.0 dl/g, measured at 30°C in a 1% solution of equal parts phenol and trichloroethane consisting essentially in the total condensed acid component of (A) 0 to 90 mol % of an acid selected from the group consisting of terephthalic acid and isophthalic acid or a mixture thereof; and of (B) 10 to 100 mol % of a dicarboxylic acid selected from the group consisting of an amidodicarboxylic acid of the formula

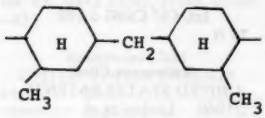


wherein x is 0 or 1, E is the —CONH—group the NH group of which is bonded to R_2 or R_3 or optionally to R_1 or R_2, and each of R_1, R_2 and R_3 independently is alkylene of 1 to 12 carbon atoms, an aromatic radical phenylene, diphenylene, naphthylene, 4,4′-sulphonediphenyl or

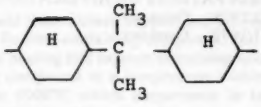


a cycloaliphatic radical

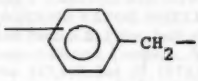




or



an aromatic-aliphatic radical



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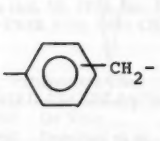
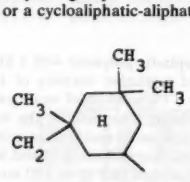
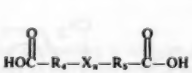


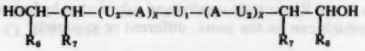
wherein the methylene groups can be bonded in the meta or para- position or a cycloaliphatic-aliphatic radical



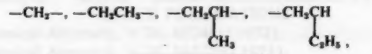
with the proviso that, if *x* is 1, R_2 cannot be the methylene group when the NH groups of the —CONH groups are bonded to R_2 and that one of R_1, R_2 and R_3 is an aromatic radical; an imidodicarboxylic acid of the structure N-carboxyalkyl-, N-carboxyphenylalkyl, N-carboxyalkylphenyl- or N-carboxyphenyltrimellitic acid imide or N,N′-carboxyalkyl-, N,N′-carboxyphenylalkyl-, N, N′-carboxyalkylphenyl-, or N, N′-carboxyphenylpyromellitic acid imide; a naphthalene dicarboxylic acid; a carboxyphenylindane carboxylic acid; and a dicarboxylic acid of the general formula

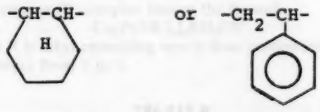


wherein *n* is 0 or 1, X represents the sulphur or oxygen atom, or the sulphone, methylene, ethylidene or propylidene radical and each of R_4 and R_5 independently represents a carboxylic ring with 4 to 6 members; and in the total condensed diol component of (C) 5 to 100 mol % of a diol selected from the group consisting of a diol of the formula

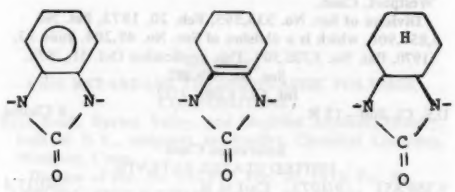


where X is 0 or 1, R_6 is hydrogen, methyl, ethyl or phenyl, R_7 is hydrogen or together with R_6 is tetramethylene, A represents a radical of the formula

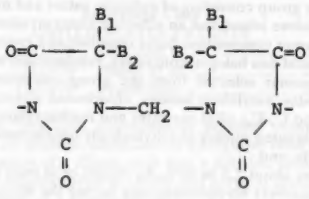




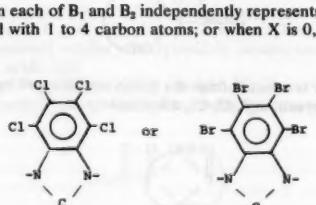
U_1 represents a radical of the formula



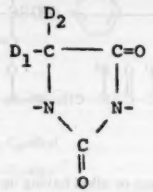
or



wherein each of B_1 and B_2 independently represents hydrogen or alkyl with 1 to 4 carbon atoms; or when X is 0, U_1 can be



and U_2 has the same meaning as U_1 or represents the formula



wherein each of D_1 and D_2 independently represents hydrogen, alkyl with 1 to 4 carbon atoms or phenyl or together D_1 and D_2 are pentamethylene; and of (D) 0 to 95 mol % of a diol selected from the group consisting of an aliphatic diol with 2 to 10 carbon atosm, 1,4-cyclohexanedimethanol and 1,4-cyclohexanediol or a mixture thereof.

B 521,984

RECOVERY OF BORIC ACID FROM ION EXCHANGERS

Charles W. Pollock, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 7, 1974, Ser. No. 521,984
Int. Cl.² C01B *35/10*
U.S. Cl. 423—283 **10 Claims**

References Cited
UNITED STATES PATENTS

2,813,838	11/1957	Lyman et al.	210/24 X
3,112,996	12/1963	Garbato	423/283
3,216,795	11/1965	Brown et al.	423/283
3,493,498	2/1970	Abrams et al.	210/32
3,567,369	3/1971	Chemtob	210/32 X
3,856,670	12/1974	Peterson	210/32

FOREIGN PATENTS OR APPLICATIONS

658,970	1/1965	Belgium	423/283 F

1. In the method for recovering boric acid from an aqueous solution by passing the solution through a strongbase anion exchange resin whereby the boric acid is adsorbed on the resin, the improvement comprising passing an aqueous ammonium bicarbonate eluent through the resin, thereby eluting the boric acid from the resin in the eluate, and heating the eluate to a temperature sufficient to volatilize and drive off the ammonium bicarbonate whereby only the boric acid remains in the solution.

B 522,567

4- OR 5-NITROIMIDAZOLES AND PROCESSES FOR THEIR MANUFACTURE

Atso Ilvespää, Neuallschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 328,816, Jan. 31, 1973, Pat. No. 3,914,248. This application Nov. 11, 1974, Ser. No. 522,567
Claims priority, application Switzerland, Feb. 8, 1972, 1810/72
Int. Cl.² C07D *49/34*
U.S. Cl. 260—309.2 **4 Claims**

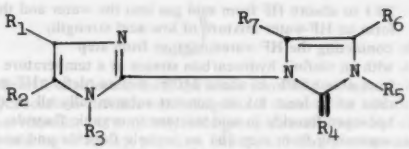
References Cited
UNITED STATES PATENTS

3,832,352	8/1974	Ilvespää	260/309.7

FOREIGN PATENTS OR APPLICATIONS

1,078,251	8/1967	United Kingdom	260/309.2
1,920,635	10/1970	Germany	260/309.2

1. An imidazole compound of the formula



wherein one of R_1 and R_2 is hydrogen or lower alkyl and the other is nitro, R_3 is hydrogen, lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl R_4 is oxo or thioxo, R_5 is hydrogen, lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, phenyl or monosubstituted phenyl substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl, and R_6 and R_7 conjointly form the missing part of a fused benzene nucleus or a benzene nucleus substituted by lower alkyl, lower alkoxy, halogen, trifluoromethyl or a nitro group, and the S-oxides, sulfones, N-oxides or acid addition salts thereof.

B 526,027

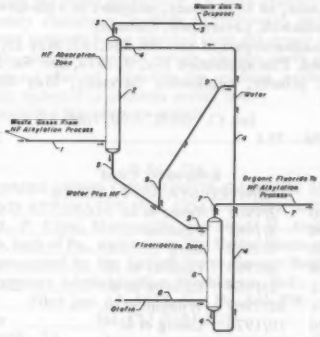
RECOVERY OF HYDROGEN FLUORIDE FROM WASTE GASES

Michael Z. Mikulicz, Palatine; William G. Boney, Rolling Meadows, and Bipin V. Vora, Buffalo Grove, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 21, 1974, Ser. No. 526,027
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.48 **2 Claims**

References Cited
UNITED STATES PATENTS

2,384,735	9/1945	Frey	260/683.42
3,716,593	2/1973	Hutson, Jr. et al.	260/653.6
3,845,158	10/1974	Sobel	260/683.49



1. In an isoparaffin-olefin alkylation process wherein hydrogen fluoride catalyst and organic fluoride are included in the alkylation reaction mixture and wherein waste gases containing HF are collected from said process, the invention comprising:

a. scrubbing a waste gas containing HF with water at a weight ratio of water to HF of from about 10:1 to about

20:1 to absorb HF from said gas into the water and thus form an HF-water mixture of low acid strength;

b. contacting the HF-water mixture from step

a. with an olefinic hydrocarbon stream at a temperature of from about 50°F. to about 110°F. and an olefin : HF mol ratio of at least 8:1 to convert substantially all of the hydrogen fluoride in said mixture to organic fluoride;

c. separating from step (b) an organic fluoride and unreacted olefin hydrocarbon phase from a water phase, and

d. supplying said organic fluoride and unreacted olefinic hydrocarbon phase to said alkylation reaction mixture.

B 529,974

QUATERNARY ARYLAMINOALKYL PHOSPHONIUM SALTS

Arlen W. Frank, Slidell, and George L. Drake, Jr., Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 376,971, July 6, 1973, Pat. No. 3,897,205. This application Dec. 5, 1974, Ser. No. 529,974

Int. Cl.² C07C *87/48*

U.S. Cl. 260—568 **2 Claims**

References Cited

UNITED STATES PATENTS

3,897,205 7/1975 Frank et al. 8/116

OTHER PUBLICATIONS

Frank et al., "Journal Organic Chemistry," Vol. 37, No. 17, pp. 2752–2755 (1972).

1. A quaternary arylaminoalkyl phosphonium salt having the formula

$$(ArNHCH_2)_4P^+Cl^-$$

where Ar is radical selected from the group consisting of phenyl, tolyl, xylyl, chlorophenyl, nitrophenyl, and naphthyl.

B 530,873

POLYMERS WHICH CAN BE CROSS-LINKED BY PHOTOPOLYMERISATION

Hans-Jürgen Rosenkranz, Krefeld; Hans Rudolph, Krefeld-Bochum; Erich Wolff, and Harald von Rintelen, both of Leverkusen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 256,162, May 23, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 530,873

Claims priority, application Germany, May 25, 1971, 2125910

Int. Cl.² G03C *5/00, 1/68*

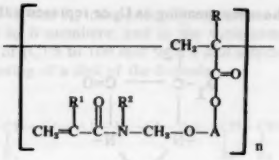
U.S. Cl. 96—35.1 **2 Claims**

References Cited

UNITED STATES PATENTS

2,972,540	2/1961	Saner et al.	96/115 P
2,976,294	3/1961	Firestine	96/115 P
3,043,805	7/1962	Burg	96/115 P
3,081,168	3/1963	Leekley et al.	96/115 R
3,427,161	2/1969	Laridon et al.	204/159.23
3,486,891	12/1969	Wilhelm et al.	96/35.1
3,533,796	10/1970	Lassig et al.	96/115 R
3,620,733	11/1971	Steppan et al.	96/115 R
3,764,501	10/1973	Hori et al.	204/159.15
3,858,510	1/1975	Kai et al.	96/35.1

1. A process for the production of photographic relief images or photoresists comprising the steps of imagewise exposing a supported light-sensitive material with a photocrosslinkable polymer in the layer, washing away the unexposed areas of the photosensitive layer to form a relief image of photocrosslinked polymeric material the improvement wherein the said photocrosslinkable polymer compound is a photopolymer of recurrent units of the general formula



wherein

R stands for hydrogen or alkyl having up to 4 carbon atoms and

R^1 represents hydrogen or alkyl having up to 4 carbon atoms,

R^2 stands for hydrogen or alkyl having up to 8 carbon atoms, and

A represents a divalent aliphatic bridging member having 2-4 carbon atoms or a bridging member of the formula $-(CH_2-CH_2-O)_m-CH_2-CH_2-$

wherein m represents an integer of 1 to 3,

n is 2 or more,

wherein the photopolymer is either a homopolymer or a copolymer with comonomers selected from the group consisting of vinyl monomers, vinyl esters, vinyl ethers, acrylic and methacrylic acid and their derivatives, maleic acid anhydride, and styrene and the light-sensitive polymer has an average molecular weight of between 10,000 and 100,000.

B 534,591

O-METHYL/ETHYL-S-PROPYL/BUTYL-O-PHENYL THIPHOSPHATES AND DITHIOPHOSPHATES HAVING A THIOETHER GROUP ON THE PHENYL RING

Ernst Beriger, Allschwil, Switzerland; Manfred Boger, Haltingen, Germany; Jozef Drabek, Allschwil, and Odd Kristiansen, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 408,874, Oct. 23, 1973, Pat. No. 3,898,305. This application Dec. 20, 1974, Ser. No. 534,591

Claims priority, application Switzerland, Nov. 3, 1972, 16043/72; Sept. 21, 1973, 13638/73

Int. Cl.² C07F *9/12*

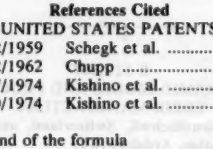
U.S. Cl. 260—948 **7 Claims**

References Cited

UNITED STATES PATENTS

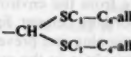
2,916,509	12/1959	Schegk et al.	260/949 X
3,020,305	2/1962	Chupp	260/948
3,825,636	7/1974	Kishino et al.	260/948 X
3,839,511	10/1974	Kishino et al.	260/964

1. A compound of the formula



wherein R_1 represents methyl or ethyl, R_2 represents n-propyl, isobutyl or sec. butyl, R_3 and R_4 each represents hydrogen, chlorine, bromine, methyl or ethyl, R_5 represents

—S—C_3—C_8—alkenyl or



and X represents oxygen or sulphur.

B 537,085

METHOD OF FORMING A ROOFING COMPOSITE USING SILICONE RUBBER COMPOSITION

Stanley J. Bessmer, Cohoes, and Warren R. Lampe, Ballston Lake, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 478,824, June 12, 1974, Pat. No. 3,888,815, which is a continuation of Ser. No. 389,733, Aug. 20, 1973, abandoned, which is a continuation of Ser. No. 180,068, Sept. 13, 1971, abandoned. This application Dec. 30, 1974, Ser. No. 537,085

Int. Cl.[2] B05D *1/12, 1/24*

U.S. Cl. 427—186 **2 Claims**

References Cited

UNITED STATES PATENTS

3,524,900	8/1970	Gibbon et al.	260/46.5 G X
3,678,033	7/1972	Kaiser et al.	260/46.5 G

FOREIGN PATENTS OR APPLICATIONS

124,650	5/1972	Norway	427/186
216,837	11/1967	Sweden	427/186

1. A process of forming a roofing composite comprising applying to a roofing substrate a self-bonding room temperature vulcanizable silicone rubber composition comprising (a) a linear, fluid organopolysiloxane containing terminal silicon-bonded hydroxy groups and having a viscosity of 500 to 10,000,000 centipoise when measured at 25°C, the organic groups of the aforesaid organopolysiloxane representing monovalent hydrocarbon radicals; (b) 5 to 300% by weight of a filler; (c) from 0.1 – 15% by weight of an alkyl silicate selected from the class consisting of (1) a monomeric organosilicate corresponding to the general formula,

$(R^{40}O)_3Si—R^{41}$,

where R^{40} is a radical selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and R^{41} is selected from the class consisting of alkyl, haloalkyl, aryl, haloaryl, alkenyl, cycloalkyl, cycloalkenyl, cyanoalkyl, alkoxy and acyloxy radicals, and (2) a liquid partial hydrolysis product of the aforementioned organosilicate monomeric compounds; (d) from 0.1 to 5% by weight of the organopolysiloxane of a catalyst which is metallic salt of an organic monocarboxylic or dicarboxylic acid in which the metal ion is selected from the class consisting of lead, tin, zirconium, antimony, iron, cadmium, barium, calcium, titanium, bismuth and manganese, and (e) from 0.1 to 10% by weight of a nitrogen-functional silane of the formula,

where R is selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, ϵ is a hydrolyzable group selected from the class consisting of alkoxy, phenoxy, amino, and dialkylamino and θ is a nitrogen-functional radical which is saturated, unsaturated or aromatic hydrocarbon residue which in addition to nitrogen-functionality may be functionalized by a radical selected from the class consisting of amino, cyano, thio, oxo, and ester, and multiples and combinations thereof and a is a whole number that varies from 0 to 2, and further where there is present 0.5 to 50% by weight of the total composition of an oxygenated solvent selected from the group consisting of alcohols, ethers, ketones, esters to form a solution of said composition and permitting said composition to cure by evaporation of said oxygenated solvent.

B 538,491

SEPARATION OF URANIUM FROM (TH,U)O_2 SOLID SOLUTIONS

Premo Chiotti, Ames, Iowa, and Mahesh Chandra Jha, Arvada, Colo., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 3, 1975, Ser. No. 538,491

Int. Cl.[2] C22B *60/02*

U.S. Cl. 75—84.1 R **7 Claims**

References Cited

OTHER PUBLICATIONS

Kately, J.A. et al. "Reaction of Thoria with Zirconium Chloride" in J. Less Com. Met., 26(1) pp. 145–155, 1972.

Chiotti, P. et al. "Binary Systems $ThCl_4$–Th and $ThCl_4$–$ThOCl_2$" in J. Less Com. Met., 31(3): pp. 365–376, June, 1973.

JHA, M.C., NSA 30: 03864 [Pyrometallurgical Separation of Uranium from (Th,U)O_2 Solid Solutions — Thesis, 1974].

1. A method for separating uranium values from a mixture of thorium oxide and uranium oxide comprising:

a. mixing the metal oxides with a molten chloride salt additionally containing thorium tetrachloride and thorium metal, said salt being selected from the group consisting of the salts of the alkali metals, alkaline earth metals and mixtures thereof, whereby the uranium oxide is selectively reduced to uranium metal, and

b. recovering the uranium metal.

B 541,376

AGGLOMERATING COMBUSTOR-GASIFIER METHOD AND APPARATUS FOR COAL GASIFICATION

Joseph L. P. Chen, Murrysville, and David H. Archer, Pittsburgh, both of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 15, 1975, Ser. No. 541,376

Int. Cl.[2] C10J *3/20*

U.S. Cl. 48—73 **11 Claims**

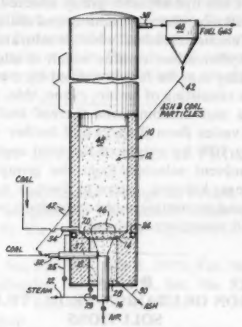
References Cited

UNITED STATES PATENTS

3,772,999	11/1973	Miller, Jr. et al.	110/28 J
3,847,563	11/1974	Archer et al.	48/202

1. Apparatus for gasification of coal particles comprising a vertically disposed refractory lined, pressure vessel, outlet means in the upper portion thereof for removing gases, an upper section of said vessel defining a gasification chamber and a lower section of said vessel being of reduced diameter

and forming a combustion chamber, a central tube for introduction of air extending into said pressure vessel through the bottom thereof and having an open upper end terminating at said combustion chamber, said tube and the lower portion of the inner refractory wall of said vessel forming an annulus, a perforated distributor plate extending across said annulus,



means for introducing coal particles into the lower part of said gasification chamber, means for introducing coal particles into said combustion chamber at the open upper end of said central tube, means for introducing stripping steam below said perforated distributor plate, and means for removal of ash from the annulus above said perforated distributor plate.

B 544,899

METHOD OF MANUFACTURING OPTICALLY ACTIVE P-HYDROXYPHENYLGLYCINE

Tadashi Shirai, Musashino; Yasuhisa Tashiro, Yokohama, and Shigeru Aoki, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1975, Ser. No. 544,899

Claims priority, application Japan, Jan. 29, 1974, 49-11423; May 8, 1974, 49-50993

Int. Cl.² C07C *143/28*

U.S. Cl. 260—501.12 **6 Claims**

References Cited

UNITED STATES PATENTS

3,523,969	8/1970	Chibata et al.	260/501.12
3,742,041	6/1973	Chibata et al.	260/501.12

1. DL-p-hydroxyphenylglycine p-toluene sulfonic acid salt.

B 548,058

METHOD FOR STORAGE OF SOLID WASTE

William J. Mecham, La Grange, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 7, 1975, Ser. No. 548,058

Int. Cl.² G21F *5/00*

U.S. Cl. 252—301.1 W **7 Claims**

References Cited

UNITED STATES PATENTS

3,152,984	10/1964	Winsche et al.	252/301.1 W
3,479,295	11/1969	Thompson	252/301.1 W
3,507,801	4/1970	Kausz et al.	252/301.1 W
3,828,197	8/1974	Boldt	252/301.1 W

FOREIGN PATENTS OR APPLICATIONS

1,109,279	6/1961	Germany	252/301.1 W
1,173,998	7/1964	Germany	252/301.1 W

1. In the method of storing high-level radioactive liquid wastes by calcining the waste to remove the liquid, thereby forming a high-level radioactive calcine, placing the calcine in a metal canister, sealing the metal canister and placing the sealed metal canister in a moisture-containing environment for cooling and long-term storage, the improvement comprising: adding powdered portland cement to the canister containing the calcined wastes so that the cement is in contact with the inner surface of the wall of the canister before the canister is sealed, whereby, should the canister wall fail and develop an opening to the environment, moisture from the environment will enter the canister, mix with the portland cement, forming concrete which will harden, seal the opening and prevent the escape of any radioactivity from the canister to the environment.

B 550,744

PHOTOCHLORINATION OF ALKANOLS

Norman C. Deno, State College, Pa., and Harry J. Spinelli, Newark, Del., assignors to Research Corporation, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,744

Int. Cl.² B01J *1/10*

U.S. Cl. 204—158 HA **23 Claims**

References Cited

UNITED STATES PATENTS

3,463,826	8/1969	Richtzenhain	204/158 HA

1. A method for the photochlorination of an alkanol which comprises reacting a C_4 or higher alkanol in a liquid aqueous buffered solvent at a pH in the range from about 4 to about 9 with chlorine in the substantial absence of oxygen while irradiating the resulting reaction mixture.

B 551,463

SILYLATED CHLOROACETANILIDES FOR THE REGULATION OF PLANT GROWTH

Manfred Kühne, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 20, 1975, Ser. No. 551,463

Claims priority, application Switzerland, Feb. 25, 1974, 2632/74

Int. Cl.² C07F *7/10*, *7/18*

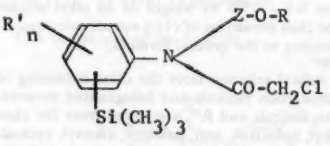
U.S. Cl. 260—448.2 N **9 Claims**

References Cited

UNITED STATES PATENTS

3,442,926	5/1969	Houtman	260/448.8 R
3,558,683	1/1971	Belsky et al.	260/448.2 N
3,651,115	3/1972	Belsky et al.	260/448.2 N
3,720,699	3/1973	Stoddard	260/448.8 R

1. Silylated chloroacetanilides of formula I



(I)

wherein

R represents a lower alkyl group having at most 4 carbon atoms, a group $-CH_2-CH_2-Si(CH_3)_3$, a group $-CH_2-Si(CH_3)_3$ or a trimethylsilyl group,

Z represents a straight or branched alkylene chain having at most 3 carbon atoms,

R' represents halogen, lower alkyl or alkoxy having at most 3 carbon atoms or trimethylsilyl, and

n represents the number 0 or 1.

B 553,584

SYNTHESIS OF ALKADIENOLS

Kenneth Earl Atkins, South Charleston; Robert Michael Manyik, St. Albans, and George Lawrence O'Connor, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 816,792, April 16, 1969, abandoned.
This application Feb. 27, 1975, Ser. No. 553,584
Int. Cl.² C07C 33/02
U.S. Cl. 260—632 R 29 Claims

References Cited
UNITED STATES PATENTS

3,008,943	11/1961	Guyer	260/683.15 D
3,361,840	1/1968	Kohll et al.	260/683.15 D
3,365,498	1/1968	Bryant et al.	260/586
3,379,706	4/1968	Wilke	260/683.15 D
3,407,224	10/1968	Smutny	260/497 A
3,454,538	7/1969	Naarmann et al.	260/683.15 D
3,499,042	3/1970	Smutny	260/632 R
3,518,315	6/1970	Smutny	260/632 R
3,534,088	10/1970	Bryant et al.	260/632 R
3,670,032	6/1972	Romanelli	260/632 R

1. Process for forming octadienols which comprises forming a reaction mixture containing butadiene, water, a solvent which is at least partially miscible with water and butadiene and carbon dioxide and a catalyst which is a palladium compound complexed with a phosphine ligand, causing the butadiene and water to react at a reaction temperature of from 20°C. to 180°C; to form an octadienol and recovering the octadienol from the reaction mixture; said butadiene, carbon dioxide and water being present in amounts sufficient to produce said octadienol.

B 561,712

TURBINE COOLING

Henry B. Brown, Manchester; Eugene Cantor, Glastonbury; Francis L. DeTolla, Vernon, and Gary J. Vollinger, Simsbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

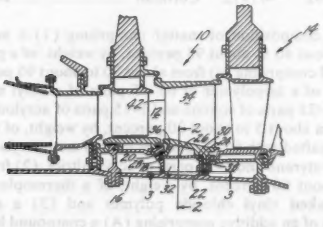
Filed Mar. 25, 1975, Ser. No. 561,712
Int. Cl.² F01D 5/18
U.S. Cl. 415—115 6 Claims

References Cited
UNITED STATES PATENTS

2,427,244	9/1947	Warner	415/136
3,423,071	1/1969	Noren	415/217
3,730,640	5/1973	Rice et al.	415/217
3,781,125	12/1973	Rahaim et al.	415/115
3,836,279	9/1974	Lee	415/115

FOREIGN PATENTS OR APPLICATIONS

200,056	11/1955	Australia	415/217
590,506	1/1960	Canada	415/115



1. In the turbine nozzle assembly of a gas turbine engine, the combination comprising:

a case which radially encloses a portion of the turbine section of the engine and which has an upstream rail extending radially inward from the case including an outwardly facing surface which extends about the full circumference of the engine, and a downstream rail extending radially inward from the case including an inwardly facing surface which extends about the full circumference of the engine;

a deformable ring which concentrically opposes the circumferential surface of the upstream rail and a downstream portion which concentrically opposes the circumferential surface of the downstream rail to form the cooling air chamber between the deformable ring and the case; and

a plurality of hollow nozzle guide vanes, each vane having a hook which engages the upstream rail of the case with the deformable ring disposed therebetween, a downstream flange which is attached to the downstream rail of the case with the downstream portion of the deformable ring trapped therebetween, and a pair of ribs which extend axially between the hook and the flange with one rib on each side of the hollow portion of the vane forming an airfoil cavity therebetween which is in gas communication with the hollow portion of the vane and forming a platform cavity between the ribs of each pair of adjacent vanes.

B 574,128

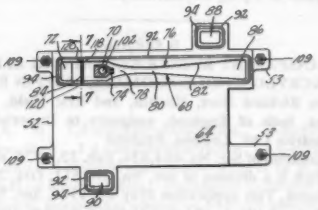
FUEL CELL STACK WITH AN INTEGRAL EJECTOR FOR REACTANT GAS RECIRCULATION

Albert P. Grasso, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1975, Ser. No. 574,128
Int. Cl.² H01M 8/06
U.S. Cl. 136—86 R 12 Claims

References Cited
UNITED STATES PATENTS

3,379,572	4/1968	Gay	136/86 B
3,542,598	11/1970	White et al.	136/100 R



1. In a fuel cell stack comprising a plurality of fuel cells each including a fuel electrode and an oxidant electrode spaced apart defining an electrolyte compartment therebetween, means constructed and arranged with said cells to define a reactant gas space on the nonelectrolyte side of each electrode, said reactant gas spaces including a fuel gas space on the nonelectrolyte side of each fuel electrode and an oxidant gas space on the nonelectrolyte side of each oxidant electrode, each of said gas spaces having an inlet and an outlet, the improvement to said stack comprising:

an ejector for delivering and recirculating one of said reactant gases through said cells, said ejector constructed and arranged to be integral with and in heat exchange relationship with the cells of said stack, said ejector including primary inlet means, secondary inlet means, and outlet means;

first conduit means connected to said ejector primary inlet means for delivering preheated reactant gas into said ejector primary inlet means;

second conduit means connecting said ejector outlet means to said inlets of said recirculating reactant gas spaces; and third conduit means connecting said recirculating reactant gas space outlets with said ejector secondary inlet means.

B 574,996

[1]BENZOTHIENO[3,2-B]FURANS

James Richard Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 6, 1975, Ser. No. 574,996

Int. Cl.[2] C07D *333/60*

U.S. Cl. 260—330.5 **5 Claims**

References Cited

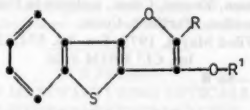
UNITED STATES PATENTS

3,499,894	3/1970	Bockstahler	260/247.1
3,659,004	4/1972	Wagner et al.	260/330.5
3,663,568	5/1972	Roos et al.	260/330.5
3,706,747	12/1972	DeAngelis et al.	260/265.5 R
3,772,336	11/1973	Wright	260/330.5
3,803,180	4/1974	Berger et al.	260/346.2 M

OTHER PUBLICATIONS

Friedlander, Chem. Ber. 32: 121 (1899).
Schroeder, et al., J. Org. Chem. 27: 586–591(1962).
Beck, J. Org. Chem. 38: 4086 (1973).

1. A compound of the formula



wherein R represents cyano, C_1–C_2 alkylcarbonyl or C_1–C_2 alkoxycarbonyl;
R^1 represents C_1–C_2 alkyl or hydrogen;
provided that R^1 represents hydrogen when R respresents cyano or C_1–C_2 alkylcarbonyl.

B 580,826

TRANSPARENT RUBBER-CONTAINING BLEND OF ACRYLONITRILE/AROMATIC OLEFIN RESIN

Charles Richard Hart, Hitchin, and Eric Nield, Watton-at-Stone, both of England, assignors to Imperial Chemical Industries Ltd., London, England

Continuation of Ser. No. 444,834, Feb. 22, 1974, abandoned, which is a division of Ser. No. 294,611, Oct. 3, 1972, abandoned. This application May 27, 1975, Ser. No. 580,826

Claims priority, application United Kingdom, Oct. 14, 1971, 47793/71; Nov. 1, 1971, 50637/71

Int. Cl.[2] C08L *51/00, 53/00*

U.S. Cl. 260—876 R **6 Claims**

References Cited

FOREIGN PATENTS OR APPLICATIONS

1,185,306	3/1970	United Kingdom	260/876 R
1,009,360	11/1965	United Kingdom	260/880 R
994,924	6/1965	United Kingdom	260/880 R

1. A blend suitable for making transparent molded articles having good impact resistance, which comprises (1) a graft copolymer having a substrate of a diene rubber having a refractive index in the range 1.544 to 1.519 and a superstrate which is a homogeneous copolymer comprising acrylonitrile and aromatic olefin containing units of acrylonitrile within the range 80 to 93 percent molar, and (2) a homogeneous acrylonitrile/ aromatic olefin resin containing units of acrylonitrile within the range 86 to 93 percent molar, the blend containing 1 to 50 percent by weight of rubber based on the weight of the blend, the resin having a refractive index at least 0.002 unit lower than that of a homogeneous copolymer of acrylonitrile and said aromatic olefin resin of the same acrylonitrile content as the superstrate, and the resin and the diene rubber used for the substrate having refractive indices differing from each other and from that of a homogeneous acrylonitrile/aromatic olefin resin of the same acrylonitrile content of the superstrate by not more than 0.008.

B 587,786

METHOD OF USING BENZOPYRANS AS ANTIPARASITIC AGENTS

John Anthony Pankavich, Hamilton Square, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 17, 1975, Ser. No. 587,786

Int. Cl.[2] A61K *31/37*

U.S. Cl. 424—281 **8 Claims**

References Cited

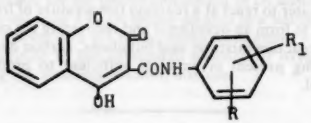
UNITED STATES PATENTS

3,511,856	5/1970	McIntyre et al.	424/281
3,511,896	5/1970	McIntyre et al.	424/281

OTHER PUBLICATIONS

Lang et al. Chem. Abst. Vol. 80, (1974), page 133192n.

1. A method for controlling helminths in a homothermic animal comprising, administering to said animal an anthelmintically effective amount of a compound of the formula:



wherein R and R_1 are selected from the group consisting of hydrogen and halogen.

B 589,966

FLAME-RETARDED ACRYLIC MULTIPOLYMER-VINYL CHLORIDE POLYMER COMPOSITIONS

Howard Robert Lucas, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 455,452, March 27, 1974, abandoned. This application June 24, 1975, Ser. No. 589,966

Int. Cl.[2] C08L *51/00, 53/00*

U.S. Cl. 260—876 R **6 Claims**

References Cited

UNITED STATES PATENTS

3,321,416	5/1967	Rauschenbach et al.	260/2.5
3,326,832	6/1967	Rauschenbach et al.	260/28.5
3,652,727	3/1972	Yonezu et al.	260/876 R
3,657,390	4/1972	Tanaka et al.	260/876 R
3,657,391	4/1972	Curfman	260/876 R

1. A composition of matter comprising (1) a mixture of from about 40 to about 95 percent, by weight, of a polymeric material comprising (a) from about 70 to about 95 percent, by weight, of a terpolymer of 65–75 parts of methyl methacrylate, 15–25 parts of styrene and 1–15 parts of acrylonitrile and (b) from about 5 to about 30 percent, by weight, of polybutadiene grafted with 65–80 parts of methyl methacrylate, 15–25 parts of styrene and 1–15 parts of acrylonitrile, (2) from about 5 to about 60 percent, by weight, of a thermoplastic, non-cross-linked vinyl chloride polymer and (3) a stabilizing amount of an additive comprising (A) a compound having the formula

$$RxSn(SR')_{4-x}$$

wherein x is 1–3, inclusive, R is alkyl, aralkyl, alkaryl, or aryl, R′ is the same as R or may include a carboxylic acid residue

or a carboxylic acid ester residue, or (B) a barium-cadmium complex, containing (4) from about 0.025 to about 5.0 percent, by weight, based on the total weight of said composition, of dicyclopentadienyl iron or chromium acetyl acetonate.

B 596,692

PHOTODEGRADABLE POLYOLEFIN COMPOSITION CONTAINING A MIXTURE OF AN ARYL KETONE AND AN ALKANOLAMINE

Allen K. Sparks, Woodstock, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 428,561, Dec. 26, 1973, abandoned. This application July 17, 1975, Ser. No. 596,692

Int. Cl.² C08K *5/17*

U.S. Cl. 260—32.6 R 6 Claims

References Cited

UNITED STATES PATENTS

3,371,048	2/1968	Cyba	260/45.95
3,625,744	12/1971	Juna et al.	204/159.23
3,661,614	5/1972	Bassemir et al.	204/159.23
3,759,807	9/1973	Osborn et al.	204/159.23
3,797,690	3/1974	Taylor et al.	260/23 H
3,825,627	7/1974	McGaugh	260/DIG. 43
3,830,764	8/1974	Hudgin et al.	260/DIG. 43

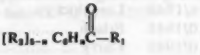
FOREIGN PATENTS OR APPLICATIONS

1,304,112	1/1973	United Kingdom	204/159.23

OTHER PUBLICATIONS

Polymer Preprints, Vol. 13, No. 2, July 15, 1972, p. 627, Scott.

1. A composition of matter comprising from about 0.01 to about 10.00 weight percent of an arylketone possessing the structure:



in which R_1 is selected from a group consisting of an alkyl, aryl, alkaryl, aralkyl, cycloalkyl, substituted alkyl, substituted aryl, substituted alkaryl, substituted aralkyl or substituted cycloalkyl radical and R_2 is selected from a group consisting of an alkyl, aryl, alkaryl, aralkyl, cycloalkyl, alkoxy, halogen, carboxy, carboalkoxy, substituted alkyl, substituted aryl, substituted alkaryl, substituted aralkyl, substituted cycloalkyl, substituted alkoxy, substituted carboxy and substituted carboalkoxy radical, and in which n is equal to an integer between 0 and 5; 0.01 to about 10.00 weight percent of an alkanol amine prepared from the reaction of an aliphatic amine or polyamine with one or more equivalents of an olefinic epoxide; and about 80.00 to about 99.98 weight percent of an olefinic polymer selected from the group consisting of polypropylene, polyethylene and polybutene.

B 490,946

CYCLIC QUATERNARY HYDROXYALKYL PHENOXIDE CATALYSTS FOR ISOCYANATE REACTIONS

Ibrahim S. Bechara, Boothwyn; Felix P. Carroll, Chester; Rocco L. Mascioli, Media, all of Pa., and John R. Panchak, Wilmington, Del., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 377,447, July 9, 1973, Pat. No. 3,892,687. This application July 23, 1974, Ser. No. 490,946

Int. Cl.² C07D *295/08*

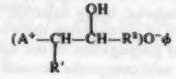
U.S. Cl. 260—268 BF 3 Claims

References Cited

UNITED STATES PATENTS

3,010,963	11/1961	Erner	260/268 T

2. A catalyst composition for use in polymerization reactions involving organic isocyanates which consists of a quaternary ammonium compound corresponding to the formula:



wherein A is 1,4-diazabicycloocatane, 2-methyl-1,4-diazabicyclooctane, 1,4-dimethylpiperazine, 1,4-diazabicycloheptane and 1,5-diazabicyclononane, R^1 is H or A methyl group, R_2 is H or a methyl, ethyl, cyclohexyl or phenyl group, and Q is phenyl, lower alkyl phenyl or hydroxy phenyl.

B 270,274

COMPOSITE ACOUSTIC LENS

Philip S. Green, Redwood City, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

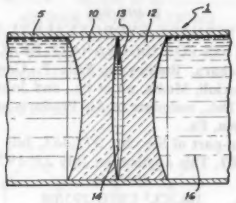
Filed July 10, 1972, Ser. No. 270,274
Int. Cl.² H04B *13/00*
U.S. Cl. 340—8 L **17 Claims**

References Cited
UNITED STATES PATENTS

2,300,251	10/1942	Flint	340/8 L
2,540,953	2/1951	Kessler	350/175 NG
2,913,602	11/1959	Joy	340/8 L
3,516,735	7/1970	Goodell	350/175 NG
3,620,326	11/1971	Hogge	340/8 L

OTHER PUBLICATIONS

Kock & Harvey, "Refracting Sound Waves," Journal of the Acoustical Society of America, Sept., 1949, pp. 471–481.



1. A composite acoustic lens adapted for use in fluid media including at least a pair of lens elements composed of a solid lens medium and a liquid filler medium included between said pair of lens elements, the materials of said lens medium and fluid filler medium being selected so that the velocity of propagation of acoustic waves in the medium on at least one side of the said composite acoustic lens is intermediate the velocity of the acoustic waves in the media of the lens and the filler, said lens element material being selected so that acoustic waves have a velocity of propagation therein which is higher than their velocity of propagation in the said medium on at least one side of the said composite acoustic lens.

B 453,533

LIQUID LEVEL DETECTOR

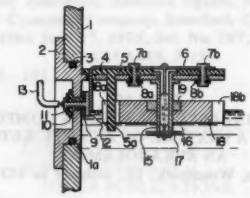
Nobumasa Higo, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 21, 1974, Ser. No. 453,533
Claims priority, application Japan, Mar. 31, 1973, 48-39476[U]
Int. Cl.² H01H *35/18*
U.S. Cl. 200—84 C **6 Claims**

References Cited
UNITED STATES PATENTS

2,927,176	3/1960	Auld, Jr. et al.	200/84 C
3,258,968	7/1966	Woodcock	200/84 C
3,750,124	7/1973	Barnes et al.	200/84 C

1. A liquid level detector for detecting the level of a liquid in a container comprising:
a body portion fitted in a mounting opening formed on one side of a container;
a supporting plate attached to and extending from said body inside said container in a horizontal direction;
a reed switch;
a case for housing said reed switch therein, said case being vertically secured to said supporting plate and said reed switch being vertically positioned;
a float formed as a horizontally long and slender shape with a length substantially greater than its width, and guided by said case to slide up and down in accordance with the change of the level of said liquid;
a turning-preventive member engaging said float to prevent turning thereof so that the longitudinal dimension of said float is oriented toward said mounting opening;



a permanent magnet mounted on the inside of said float to open and close said reed switch in accordance with the change of the level of said liquid;
a stopper for sealing said float in said case;
an electric connecting plate connected to said reed switch, and
an insulating board for electrically insulating said electric connecting plate from said supporting plate, said insulating board formed integral with said turning-preventive member.

B 477,597

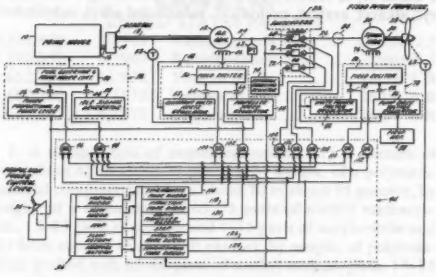
MARINE PROPULSION SYSTEM

Thomas E. Ekstrom, and Richard L. Koch, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 10, 1974, Ser. No. 477,597
Int. Cl.² B60L *11/02*
U.S. Cl. 290—17 **1 Claim**

References Cited
UNITED STATES PATENTS

2,321,302	6/1943	Liwschitz	318/148
2,451,936	10/1948	Frisch	318/148
2,454,778	10/1948	Curry	318/148



1. A marine propulsion system comprising:
a power propulsion lever manually movable between and within a normal ahead range, a slow ahead range, a slow astern range, and a normal astern range;

a gas turbine engine including means for controlling the output thereof between an idle setting and a maximum power setting response to the position of said power propulsion lever, said gas turbine being in said idle setting when said lever is positioned in said slow ahead and slow astern ranges;

an AC generator, said generator connected to and driven by said gas turbine and including a field winding;

a synchronous motor electrically connected to the output of said generator and including a field winding;

a fixed pitch marine propeller connected to an output shaft of said motor;

a braking resistor;

switchgear means for selectively providing a first, second and third electrical connection between said generator and said motor, said first electrical connection causing said motor to produce torque in an ahead direction, said second electrical connection reversing the phase connection from that of said first electrical connection, said third electrical connection reversing the phase connection from that of said first electrical connection and connecting said braking resistor in series between said generator and said motor; and

means for controlling the excitation current in said generator field winding, the excitation current in said motor field windings and said switchgear means in response to the setting of said power control lever and selected parameters of propulsion system operation whereby when said lever is in said normal ahead and astern range said motor is operated synchronously, when said lever is in said slow ahead and astern range said motor is operated in a controlled manner asynchronously, and when said lever is rapidly moved from the normal ahead range to the normal astern range said switchgear means assumes said third connection and the field current is removed from said generator winding and applied to said motor winding so as to brake said propeller before torque is applied in the astern direction by operating said motor as a generator and absorbing the generated energy using the wiring of the propulsion system and said generator.

B 491,111

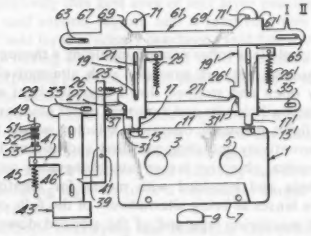
TAPE RECORDERS

Theophiel Clement Jozef Lodewijk Staar, Kraainem, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed July 23, 1974, Ser. No. 491,111
Claims priority, application Belgium, Aug. 14, 1973, 44280
Int. Cl.[2] G11B *15/04*
U.S. Cl. 360—60 **3 Claims**

References Cited
UNITED STATES PATENTS

3,677,556	7/1972	Oosone	360/60



1. In a tape recorder apparatus for the recording of information on a magnetic tape extending between reels in a cartridge, said apparatus having means for transporting the tape and recording on the tape in a cartridge in both directions of tape travel, the tape cartridge being provided with a pair of recesses corresponding respectively to each direction of tape travel and a removable tab over each recess, said apparatus having sensing and control means cooperating with said removable tabs for preventing recording in either direction of tape travel when the corresponding tab is absent, the improvement in said sensing and control means comprising:

a movable tape direction control slide having two positions corresponding respectively to the directions of tape travel,

a first and second sensing means each including a movable slide mechanism mounted in said apparatus for sensing the absence of said removable tabs by movement into the recesses in the cartridge at the location of said tabs and a displaceable output member directly connected for displacement by the associated slide mechanism upon such movement,

means for biasing each said slide mechanism against one of said tabs and to move into the recess in the absence of the tab,

means actuated by said tape direction control slide for disabling one of said sensing means and for enabling the other of said sensing means to sense and produce an output reflecting the absence of the removable tab corresponding to the direction of tape travel by the slide mechanism moving into the recess in the cartridge at the location of said tab and displacing the associated output member,

a movable recording function indicator, said indicator being slidably mounted and biased in one direction,

a latching mechanism for said indicator operated in response to the displacement of the output member by said enabled sensing means to unlatch said indicator allowing it to move in the direction of bias,

the unlatched condition of the recording function indicator providing an indication that tape recording is to be prevented.

B 507,087

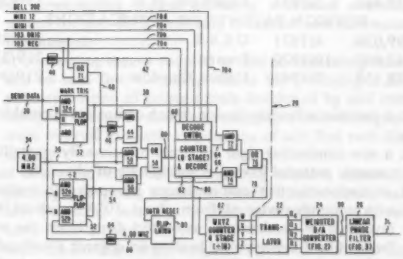
DIGITAL FREQUENCY SHIFT KEY MODULATOR

Jerold Dennis Dwire, Byron, and Townsend Henry Porter, Jr., Rochester, both of Minn., assignors to International Business Machines, Armonk, N.Y.

Filed Sept. 18, 1974, Ser. No. 507,087
Int. Cl.[2] 332 *11 R*; **H04L** *27/12*
U.S. Cl. 332—9 R **2 Claims**

References Cited
UNITED STATES PATENTS

3,600,680	8/1971	Maniere et al.	325/163 X
3,659,048	4/1972	Zuerblis et al.	325/163 X
3,668,562	6/1972	Fritkin	332/9 R
3,713,017	1/1973	Vena	332/11 R X
3,773,975	11/1973	Koziol	332/9 R
3,787,785	1/1974	Bass	325/163 X



1. A modulator for producing output sine wave signals of

different frequencies to correspond with different mark and space signal levels on an input of the modulator, comprising:

an oscillator,

a first counter driven by said oscillator and having a pair of outputs and being constructed so as to have a signal on a first one of its said outputs for a predetermined number of input pulses applied to it from said oscillator and to have a signal on its second output for another predetermined number of input pulses applied to it from said oscillator,

a second counter having a plurality of outputs,

gating means under the control of said mark and space signal levels so as to connect said first output of said first counter to said second counter on the existence of said mark signal level and to connect said second output of said first counter to said second counter on the existence of said space signal level,

synthesizing means having said outputs of said second counter as inputs and effective to produce an output signal which first increases in steps and then decreases in steps that correspond with the increasing discrete counts in said second counter to thereby synthesize and produce stepped sine wave output signals,

a filter having said stepped sine wave output signals applied thereto as an input and smoothing the signals to produce smooth sine wave output signals having different frequencies in accordance with the mark and space signal levels applied to the modulator, and

a selectively operated control effective on said first counter for changing at least one of said predetermined number of input pulses applied to said first counter from said oscillator for each output signal on one of said outputs of said first counter so as to thereby change the relationship of the frequencies of said output signals from said filter corresponding to said mark and space signal levels.

B 513,027

MONOLITHIC HONEYCOMB FORM ELECTRIC HEATING DEVICE

George L. Hervert, Woodstock, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 8, 1974, Ser. No. 513,027

Int. Cl.² H05B 3/10

U.S. Cl. 219—553 **7 Claims**

References Cited

UNITED STATES PATENTS

2,767,289	10/1956	Robinson	338/223
3,032,635	5/1962	Kraft	338/283 X
3,075,494	1/1963	Toulmin, Jr.	118/49.5
3,163,841	12/1964	Willett	338/292
3,172,774	3/1965	Diefendorf	427/249
3,345,448	10/1967	Malkin	13/25
3,502,596	3/1970	Sowards	252/477
3,651,386	3/1972	Youtsey et al.	357/10
3,825,460	7/1974	Yoshikawa et al.	156/296

FOREIGN PATENTS OR APPLICATIONS

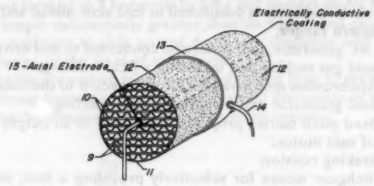
299,036	4/1971	U.S.S.R.	219/381
512,667	10/1920	France	219/374
932,558	7/1963	United Kingdom	219/300

1. A resistance heating device, which comprises in combination:

a. a non-conducting rigid substrate of primarily crystalline ceramic material having a multiplicity of channels;

b. a semiconducting carbonaceous pyropolymer coating, with a conductivity of from about 10^{-8} to about 10^{2} inverse ohm-centimeters, deposited directly on the surfaces of said substrate by heating an organic pyrolyzable substance in a primarily non-oxidizing atmosphere and in contact with the substrate surfaces at a temperature above about 400° C.; and

c. spaced electrodes connected to opposing portions of said coated substrate, whereby the semiconducting carbonaceous surfaces positioned between such electrodes can provide electrical resistance heating from electrical energy supplied to the electrodes.



B 515,135

MEASUREMENT MODE INTERLOCK MECHANISM IN CAMERA TTL LIGHT MEASURING SYSTEM

Tetsuji Shono, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1974, Ser. No. 515,135

Claims priority, application Japan, Oct. 19, 1973, 48-122179[U]

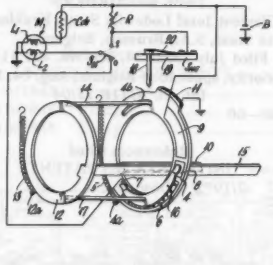
Int. Cl.² G03B 7/20

U.S. Cl. 354—46 **6 Claims**

References Cited

UNITED STATES PATENTS

3,465,661	9/1969	Hahn et al.	354/60 E
3,470,807	10/1969	Uno	354/40 X
3,486,434	12/1969	Suzuki et al.	354/46 X
3,589,252	6/1971	Hahn et al.	354/46 X
3,603,234	9/1971	Strehle et al.	354/40 X
3,721,168	3/1973	Noack et al.	354/47
3,785,266	1/1974	Watanabe	354/46



1. In a single lens reflex camera including a through the lens light measuring network provided with alternatively actuatable fully open and stopped down aperture light measuring first and second circuits and a current meter responsive to the incident light; manually operative selector means for selectively alternatively actuating said first and second light measuring circuits, objective lenses interchangeably mounted on said camera and provided with means for identifying said respective lenses as being alternatively of the fully open aperture light measuring type and of the stopped down aperture type respectively, and means responsive to the concurrent mounting of an objective lens identified as a fully open aperture type and to the manual selection of said second circuit for disabling the light measuring operation of said network, said selector means being operable independently of the objective type of mounted on said camera lens.

B 516,060

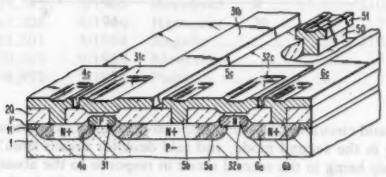
SEMICONDUCTOR DEVICES

William S. Johnson, Hopewell Junction, N.Y., assignor to International Business Machines, Armonk, N.Y.

Division of Ser. No. 377,851, July 9, 1973, Pat. No. 3,873,372.
This application Oct. 18, 1974, Ser. No. 516,060
Int. Cl.² H01L 29/78, 27/02
U.S. Cl. 357—23 4 Claims

References Cited
UNITED STATES PATENTS

3,653,978	4/1972	Robinson et al.	357/42
3,789,503	2/1974	Nishida et al.	357/23



1. A semiconductor device structure including an enhancement mode field effect transistor and a depletion mode field effect transistor, said semiconductor device structure comprising:
- a body of silicon semiconductor material of P— conductivity type and having at least one planar surface;
- a first discrete region of N+ conductivity type lying beneath and extending to said surface of said planar surface;
- a second discrete region of P conductivity type lying beneath and extending to said surface of said planar surface;
- a third discrete region of N+ conductivity type lying beneath and extending to said surface of said planar surface;
- a fourth discrete region of N conductivity type lying beneath and extending to said surface of said planar surface;
- a fifth discrete region of N+ conductivity type lying beneath and extending to said surface of said planar surface;
- said second region lying between and extending from said first region to said third region;
- said fourth region lying between and extending from said third region to said fifth region;
- a sixth discrete region of P conductivity type;
- said sixth region lying beneath and extending to the surface of said planar surface;
- said first, second, third, fourth and fifth regions being wholly encompassed on said planar surface by said sixth region;
- a relatively thick insulating layer overlaying said planar surface;
- said layer being of substantially uniform thickness except for a relatively thin first area of said layer precisely overlaying said second region, and a relatively thin second area of said layer precisely overlaying said fourth region;
- said layer having first, second and third apertures respectively exposing portions of said planar surface in said first, third and fifth regions;
- first, second and third electrodes respectively making electrical contact with via said first, second and third apertures with said first, third and fifth regions;
- a fourth electrode overlaying said relatively thin first area of said insulating layer to form a capacitive couple to said second region;
- a fifth electrode overlaying said relatively thin second area of said insulating layer to form a capacitive couple to said fourth region;
- where said first region constitutes the source of said enhancement mode field effect transistor, said second region constitutes the channel of said enhancement mode field effect transistor, said third region constitutes the drain of said enhancement mode field effect transistor and the source of said depletion mode transistor,
- said fourth region constitutes the channel of said depletion mode field effect transistor,
- said fifth region constitutes the source of said depletion mode field effect transistor,
- said fourth electrode constitutes the gate electrode of said enhancement mode field effect transistor,
- said fifth electrode constitutes the gate electrode of said depletion mode field effect transistor, and
- said sixth region provides field protection for said structure comprising said enhancement mode field effect transistor and said depletion mode field effect transistor.

B 516,564

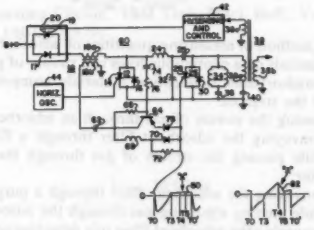
GATING CIRCUIT FOR THYRISTOR DEFLECTION SYSTEM

Willem den Hollander, Schlieren, Netherlands, assignor to RCA Corporation, New York, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,564
Claims priority, application United Kingdom, Aug. 22, 1974, 369848/74
Int. Cl.² H01J 29/70
U.S. Cl. 315—408 9 Claims

References Cited
UNITED STATES PATENTS

3,452,244	6/1969	Dietz	315/408
3,517,253	6/1970	Dietz	315/408
3,638,067	1/1972	Dietz	315/408
3,767,960	10/1973	Ahrens	315/408
3,767,963	10/1973	McArdle	315/408



9. In a deflection system a gating circuit comprising:
- a first switching means coupled to a deflection winding for supplying a first quantity of energy to said deflection winding during a trace interval of each deflection cycle;
- a commutating means coupled to said deflection winding for supplying a second quantity of energy to said deflection winding during a commutating interval of each deflection cycle;
- said commutating means including a second switching means for providing switching to initiate said commutating interval;
- first conducting means coupled to said commutating means and to said first switching means for providing a first polarity portion of gating signals developed by said commutating means to said first switching means during said trace interval to enable conduction of said first switching means;
- said first conducting means including reactive means for peaking said gating signals to enable conduction of said first switching means at a predetermined point in said trace interval; and
- second conducting means coupled in parallel with said first conducting means and to said second switching means for providing a second polarity portion of said gating signals to said first switching means during conduction of said

second switching means to enable the turn off of said first switching means during said commutating interval.

B 526,190

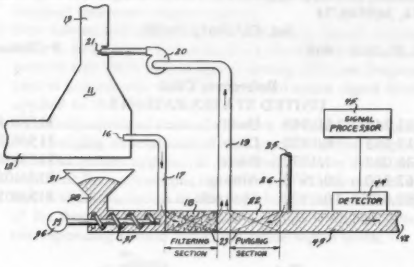
METHOD AND MEANS OF MONITORING THE EFFLUENT FROM NUCLEAR FACILITIES

Kenneth R. Lattin, and Gerald L. Erickson, both of Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 22, 1974, Ser. No. 526,190
Int. Cl.² G01T *1/20*
U.S. Cl. 250—364 **8 Claims**

References Cited
UNITED STATES PATENTS

3,185,845	5/1965	Lively et al.	250/304
3,590,247	6/1971	Holford	250/304
3,864,574	2/1975	Wilhelm et al.	250/364



1. A method of measuring quantities of adsorbable radioactive materials on a continuous basis in a stream of gas containing nonadsorbable radioactive materials comprising in sequence the steps of:

a. passing the stream of gas through an adsorbent filter;

b. conveying the adsorbent filter through a filter section while passing the stream of gas through the adsorbent filter;

c. conveying the adsorbent filter through a purging section while passing a purging gas through the adsorbent filter;

d. conveying the adsorbent filter to a detecting section; and

e. measuring in the detecting section the radiation emitted by radioactive materials remaining on the adsorbent filter.

B 527,187

CONDITION-INITIATED LOAD CONTROL CIRCUIT

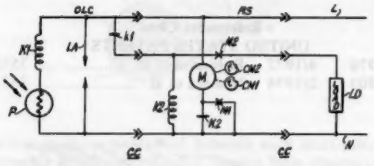
John J. Powers, East Weymouth, and Joseph R. Thibodeau, Dedham, both of Mass., assignors to Sigma Instruments, Inc., Braintree, Mass.

Filed Nov. 26, 1974, Ser. No. 527,187
Int. Cl.² H03H *9/00*
U.S. Cl. 317—124 **24 Claims**

References Cited
UNITED STATES PATENTS

2,697,803	12/1954	Eadie, Jr.	317/124

1. An apparatus for energizing a load from energy carrying conductors, comprising detector means responsive to a cyclically recurring physical condition for exhibiting a first mode in response to the physical condition and a second mode in response to the absence of the condition, control means exhibiting a first mode and a second mode and coupled to said detector means for shifting from the first mode to the second mode while the detector means is in the first mode, and for shifting back to the first mode after a given time less than the period of the cyclically recurring physical condition, and circuit means for coupling the detector means and the conductors and the control means and the load in circuit relationship; said circuit means being responsive to said control means being in the second mode, and said detector means simultaneously being in the second mode in response to the absence of the condition, for connecting the lines across the load.



B 530,813

CLASS AB-DUAL PUSH-PULL AMPLIFIER

David Gene Ross, Red Bank, and Paul Schnitzler, Kendall Park, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

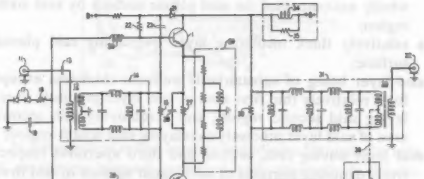
Filed Dec. 9, 1974, Ser. No. 530,813
Int. Cl.² H03F *3/26*
U.S. Cl. 330—15 **9 Claims**

References Cited
UNITED STATES PATENTS

3,239,772	3/1966	Dennis	330/15 X
3,421,099	1/1969	O'Malley	330/15
3,676,613	7/1972	Brewer	179/170 T
3,806,862	4/1974	Chao	330/15 X

FOREIGN PATENTS OR APPLICATIONS

1,178,897	10/1964	Germany	330/118



1. A linear amplifier comprising a pair of transistors each having an emitter, a collector and a base electrode, means for connecting the transistors in push-pull configuration, means for biasing the transistors at or near collector saturation, and means for providing a constant current source for at least short durations.

B 539,746

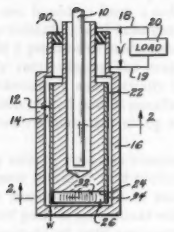
THERMIONIC CONVERTER

Ned S. Rasor, Sunnyvale, and Edward J. Britt, Cupertino, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 9, 1975, Ser. No. 539,746
Int. Cl.² A01J 45/00
U.S. Cl. 310—4 R 7 Claims

References Cited
UNITED STATES PATENTS

2,510,397	6/1950	Hansell	310/4
3,021,472	2/1962	Hernquist	310/4 X
3,238,395	3/1966	Sense	310/4
3,239,745	3/1966	Hernquist	310/4 X
3,267,308	8/1966	Hernquist	310/4
3,381,201	4/1968	Angello	310/4 X
3,470,393	9/1969	Moncorge	310/4
3,578,992	5/1971	Paine	310/4



1. A gas-filled thermionic converter for generating a current through a load in response to heat applied to the converter from a heat source, comprising, a collector, an emitter coupled to said collector by the load and having a main emitter surface region so positioned with respect to said collector to form a main gap therebetween and having an auxiliary emitter surface region in direct electrical and thermal contact with said main emitter region so that said regions are at about the same temperature, said auxiliary emitter region being so positioned with respect to said collector to form an auxiliary gap therebetween partially isolated from said main gap with access allowed therebetween, and an ionizable gas within said auxiliary gap and said main gap capable of migrating therebetween, with sufficient heat from the heat source applied to said emitter to cause the emission of electrons therefrom, the work function of said auxiliary emitter region being of such value with respect to the sum of the work function of said collector and the voltage across the load that an ignited discharge occurs between the auxiliary emitter and collector in said auxiliary region and the work function of said main emitter region being of sufficient value with respect to the sum of the work function of said collector and the voltage across the load that an unignited discharge occurs in said main gap simultaneously with the ignited discharge in said auxiliary gap, said ignited discharge ionizing a portion of said ionizable gas so that the resulting ionized gas migrates to said main gap to sustain said unignited discharge.

B 548,302

CHARGE CANCELING STRUCTURE AND METHOD FOR INTEGRATED CIRCUITS

Kenneth R. Stafford, and John P. Guadagna, both of San Jose, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Feb. 10, 1975, Ser. No. 548,302
Int. Cl.² H03K 17/16, 17/60
U.S. Cl. 307—251 3 Claims

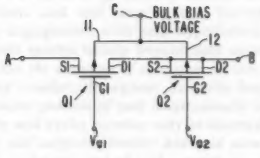
References Cited
UNITED STATES PATENTS

3,636,378	1/1972	Ohashi et al.	307/251
3,662,356	5/1972	Michon et al.	357/23 X
3,704,384	11/1972	Desimone	356/23 X
3,753,132	8/1973	Hill	307/251 X
3,808,458	4/1974	Mundy et al.	307/251 X
3,859,545	1/1975	Clemons et al.	307/251 X

OTHER PUBLICATIONS

Rossero, "Analog Switch With Gating Spike Suppression;" IBM Tech. Discl. Bull.; Vol. 14, No. 9, pp. 2825–2826; 2/1972.

Crider, "Resetting Circuit;" IBM Tech. Discl. Bull.; Vol. 12, No. 10, pp. 1601; 3/1970.



3. The method of operating a transistor switching circuit comprising a first MOS switching transistor and a second MOS charge cancelling transistor wherein said second MOS charge cancelling transistor possesses a source and drain region each connected to the drain of said first MOS switching transistor, comprising the steps of:

1. applying a first gate voltage to the gate of said first MOS transistor; and
2. simultaneously applying a second gate voltage, the complement of said first gate voltage, to the gate of said second MOS transistor thereby to cancel any charge induced by said first gate voltage in the drain of said first MOS transistor by a charge equal in magnitude but opposite in polarity induced in the source and drain regions of said second MOS transistor.

REISSUES

FEBRUARY 17, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

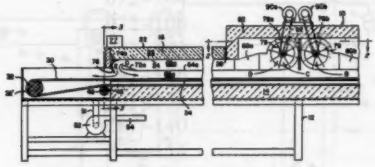
Re. 28,712
PARALLEL FLOW CRYOGENIC FREEZER

David J. Klee, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Original No. 3,345,828, dated Oct. 10, 1967, Ser. No. 463,196, June 11, 1965. Application for reissue Aug. 6, 1969, Ser. No. 849,223

Int. Cl.[2] F25D *3/10*

U.S. Cl. 62—216 11 Claims



1. A method for ultra-fast freezing of products with a cryogenic refrigerant including the steps of:

(a) continuously moving said product to be frozen through an insulated tunnel along a predetermined path;

(b) continuously contacting said product with a cryogenic liquid in said tunnel to freeze the product while vaporizing the cryogenic liquid to form a cold gas;

(c) continuously collecting said cold gas resulting from said vaporization in a portion of said tunnel;

(d) continuously recirculating the major portion of said collected gas through a substantially closed path at least one-half of which closed path is parallel to and coincident with said predetermined path along a substantial extent thereof;

(e) continuously adding cold gas resulting from newly vaporized cryogenic liquid to said recirculation path;

(f) continuously removing some of said recirculated gas from said closed path in an amount which is substantially equal to the amount of cold gas continuously added to said recirculation path;

(g) maintaining the velocity of said recirculated gas in said closed path sufficient to cause turbulent flow of the gas in contact with said food product;

(h) collecting a minor portion of said cold gas in a reservoir immediately adjacent the outlet of said tunnel;

(i) detecting the level of said cold gas in said reservoir; and

(j) regulating the amount of recirculated gas which is removed from said substantially closed path as a function of said detected level.

Re. 28,713
HYPODERMIC NEEDLE AND SUPPORT STRUCTURE THEREFOR

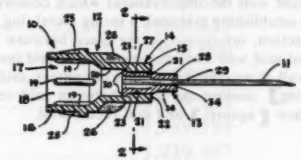
Peter A. Stevens, Middlebury, Conn., and Donald W. Utting, Deland, Fla., assignors to Sherwood Medical Industries, Inc., St. Louis, Mo.

Original No. 3,234,944, dated Feb. 15, 1966, Ser. No. 243,573, Dec. 10, 1962. Application for reissue Oct. 1, 1973, Ser. No. 402,308

Int. Cl. A61m *5/32*

U.S. Cl. 128—221 4 Claims

1. A hypodermic needle support structure comprising in combination [;] : a plastic main support member having *an inner end, and an outer end portion terminating in an outer end;* a passage extending longitudinally *through said support member to provide* [therethrough which provides] access to the interior of said support member from either end thereof; *said longitudinally extending passage including a smaller diameter portion adjacent said outer end and a larger diameter portion adjacent to said smaller diameter portion; means defining a shoulder between said smaller diameter portion and said larger diameter portion;* [with said support member having at the outer end]; *said outer end portion of said support member including* a rigid support section [,]; a generally tubular metal eyelet member; *a hypodermic needle cannula; said eyelet member being* disposed in fluid-sealing engagement with said support section and forming a fixed fluid-sealing engagement with [a] *said* hypodermic needle cannula, said eyelet member having *an inner end disposed within said smaller diameter portion of said support member and an outer end extending axially through sid outer end of said support member; a radially outwardly extending skirt section on said inner end of said eyelet member; said skirt section having an outer diameter which is larger than the diameter of said smaller diameter portion of said longitudinally extending passage in said support member and which is in fluid-sealing engagement with said shoulder between*



said smaller and larger diameter portions of said longitudinally extending passage; said [at the inner end thereof a] skirt section [with] *having* a diameter larger than the outer diameter of said hypodermic needle cannula and [with] said skirt section forming said fluid-sealing engagement with said support section, and said eyelet member having extending axially from the outer end of said skirt section a tubular stem section which extends longitudinally beyond the end of said support section, and said stem section forming said fixed fluid-sealing engagement with said hypodermic needle cannula at a point spaced axially beyond said outer end of said support section *the diameter of said stem section of said eyelet member being smaller, throughout its entire length, than the smallest diameter portion of said longitudinally extending passage, whereby said eyelet member may be inserted through said inner end of said support member and said stem section may pass through said outer end of said support member until said skirt section engages said shoulder between said smaller and larger portions of said longitudinally extending passage in said support member.*

Re. 28,714
INTERNAL SEAL FOR ROTARY PISTON COMBUSTION ENGINE

Max Ruf, Obereisesheim, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft and Wankel GmbH, both of, Germany

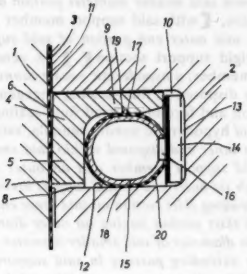
Original No. 3,802,812, dated Apr. 9, 1974, Ser. No. 271,766, July 14, 1972. Application for reissue Aug. 29, 1974, Ser. No. 501,655

Int. Cl.[2] F01C *19/12*

U.S. Cl. 418—142 5 Claims

1. An internal seal for rotary piston combustion engines of the trochoid type having a housing of two end pieces and a multi-arcuate shell in which a polygonal piston is rotatably mounted on an eccentric, the piston having at least one sealing

ring concentric with its axis of rotation in a recess on each of its two end faces the sealing ring being pressed by spring means against the adjoining end piece and sealingly slidable thereon, said sealing ring having [a] *an inner* surface parallel to *and spaced from* a wall of said recess and means for establishing a seal between said *inner surface of said* sealing



ring and said wall the improvement which comprises as the means for establishing said seal; a spring metal ring, C-shaped in cross-section, interposed *in the space* between said *inner* surface and said wall and abutting each of said *inner* surface and said wall along continuous lines of contact, said C-shaped ring [forcing] *sealing the space between* said sealing ring *inner* surface [against] *and* said recess wall.

Re. 28,715

POLYURETHANES, REACTIVE SOLUTIONS AND METHODS AND THEIR PRODUCTION

Paul Stamberger, 552 W. University Parkway, Baltimore, Md. 21210

Original No. 3,383,351, dated May 14, 1968, Ser. No. 389,184, Aug. 12, 1964. Application for reissue Feb. 19, 1974, Ser. No. 443,717

Int. Cl.² C08K *5/06*

U.S. Cl. 260—33.2 R **32 Claims**

1. A method for preparing reactive compositions convertible to elastic polyurethane products [by] comprising the steps of

(a) dispersing a minor amount of ethylenically unsaturated monomer in a major amount of a solvent medium, said solvent medium consisting essentially of at least one normally liquid polyol essentially free from ethylenic unsaturation and having a molecular weight of at least about 2,000 and a hydroxyl number in the range of about 30 to about [140] *600, said hydroxyl number being appropriate to provide an elastic polyurethane*, and

(b) polymerizing said monomer in said solvent by free radical addition polymerization to a substantially linear polymer having a molecular weight of at least 5,000 to provide a liquid, stable dispersion of polymerpolyol having a viscosity of less than 40,000 cps at 10% polymer concentration.

said *substantially linear* polymer being film-forming and *having radicals reactive with isocyanate radicals*, said reactive composition being convertible to an elastic polyurethane product upon reaction with an organic polyisocyanate.

Re. 28,716

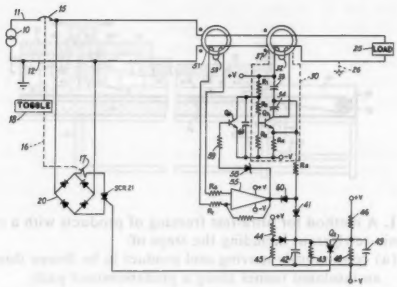
APPARATUS FOR DETECTING A GROUND CONNECTION ON LOAD SIDE OF NEUTRAL CONDUCTOR

James R. Montz, Two Rivers, Wis., assignor to AMF Incorporated, White Plains, N.Y.

Original No. 3,800,189, dated Mar. 26, 1974, Ser. No. 310,184, Nov. 28, 1972. Application for reissue Mar. 21, 1975, Ser. No. 560,852

Int. Cl.² H02H *3/16, 3/28*

U.S. Cl. 317—18 D **23 Claims**



20. A fault protection circuit for use in an electrical supply system to disconnect one or more conductors of the system from the system source in the event of a fault in the system, said circuit comprising

fault sensing means coupled to the conductors between the system source and load for producing an electrical signal in response to a fault condition in the system,

a time constant detection circuit for providing a d.c. voltage, said detection circuit having a given discharge rate in the absence of an input signal thereto,

voltage means for maintaining a d.c. voltage of a first magnitude in said detection circuit in the absence of a fault in said system,

first diode means coupled between said voltage means and said detection circuit and connected to prevent discharge of the time constant detector circuit therethrough,

second diode means having one terminal coupled to said fault sensing means and its other terminal coupled between said voltage means and said first diode means,

said second diode means being rendered conductive by said electrical signal from the fault sensing means,

said second diode means being connected with a polarity to block current flow through said first diode means upon occurrence of said electrical signal from the fault sensing means, whereby the voltage magnitude in said time constant detection circuit will change to a second magnitude,

a semiconductor device having at least two terminals and operable between conducting and nonconducting states,

means for coupling the first terminal of the semiconductor device to said detection circuit,

means for coupling a voltage source to the second terminal of the semiconductor device, the magnitude of the voltage of said voltage source being proportioned with respect to the characteristics and parameters of the semiconductor device to maintain said device in one of its states when the voltage in said detection circuit is at said first magnitude and to transfer said device to its other state when the voltage magnitude in said detection circuit is at said second magnitude, and

means coupled to said semiconductor device for interrupting supply system current on said conductors in response to said semiconductor device transferring to said other state.

PATENTS

GRANTED FEBRUARY 17, 1976

ERRATA

For CLASS	See PATENT NO.
072-104	3,938,374
072-108	3,938,375
222-102	3,938,474
197-176	3,938,644
241-231	3,938,732
267-140	3,938,795
296-154	3,938,856
297-263	3,938,857
297-284	3,938,858
297-385	3,938,859
297-440	3,938,860
297-027	3,938,861
424-309	3,939,253
323-022 T	3,939,399
325-047	3,939,407
357-072	3,939,488

PATENTS

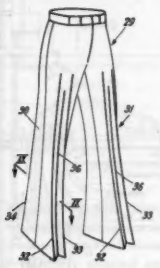
GRANTED FEBRUARY 17, 1976

GENERAL AND MECHANICAL

3,938,196
TROUSERS

Raymond Zaoui, 11 rue Le Vau, Paris, France

Filed Nov. 9, 1973, Ser. No. 414,325
Claims priority, application France, May 29, 1973, 73.19442
Int. Cl.[2] A41D 1/10
U.S. Cl. 2—227 1 Claim

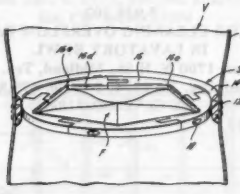


1. A pair of trousers comprising a pair of legs, each leg formed of only two side-pieces joined together along a line of stitching at the inseam and the outseam areas, each leg having at least three ribbed creases extending generally longitudinally along its periphery and comprising longitudinally extending ridges, and each leg having at least one inwardly recessed pleat extending generally longitudinally along the trouser leg and located between two adjacent ribbed creases.

3,938,197
CENTRAL FLOW PROSTHETIC CARDIAC VALVE

Simcha Milo, 4/19 Edmond Fleg St., Haifa, Israel

Filed Sept. 3, 1974, Ser. No. 502,306
Int. Cl.[2] A61F 1/22
U.S. Cl. 3—1.5 13 Claims



10. In a prosthetic cardiac valve adapted to be disposed within the aortic, mitral, or tricuspid rings, having an annular valve support forming an opening and at least one valve flap pivotally disposed about the annular valve support to close said opening, the improvement residing in the valve flap which comprises:

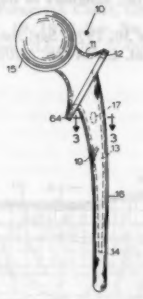
a generally flat body of a generally triangular configuration having a base pivotally mounted on the valve support at a hinged portion thereof and an end opposite said base and adapted to close the opening in the annular valve support when in the closed position and to pivot to open the same; and,

a curved sealing surface formed adjacent said hinged portion of said flap body cooperating with means on said valve support for sealably joining said flap body with the valve support while the valve is in an open or a closed position.

3,938,198
HIP JOINT PROSTHESIS

Paul Kahn, San Francisco, and James A. Stubstad, Lafayette, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Continuation of Ser. No. 162,936, July 15, 1971, abandoned, and a continuation-in-part of Ser. No. 60,804, Aug. 4, 1970, abandoned. This application Sept. 27, 1973, Ser. No. 401,506
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—1.912 6 Claims



6. A femoral head prosthesis, including in combination:

a. a rigid ball member,

b. a rigid stem core membet extending from said ball member and integral therewith,

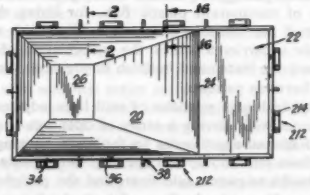
c. a cushioning coating of elastomer secured to and at least partially enclosing said stem core member, and

d. a surface layer of fibrous material capable of receiving tissue ingrowth secured to at least a portion of said elastomer.

3,938,199
SWIMMING POOL COMPONENTS

Merrill L. Laven, 4 Marion Ave., Albany, N.Y. 12203

Filed Dec. 27, 1973, Ser. No. 428,882
Int. Cl.[2] E04H 3/16, 3/18; F16L 21/02
U.S. Cl. 4—172.19 38 Claims



1. In a swimming pool, a plastic liner sheet having an inner surface defining the interior of the pool and an outer surface directed away from the interior of the pool, substantially rigid plastic backing means engaging said sheet at the outer surface thereof and forming a backing for said sheet, and concrete-retaining means operatively connected with an upper region

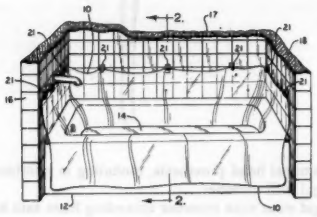
of said plastic backing means and being composed of a plastic sheet material which extends from said upper region of said plastic backing means first upwardly and inwardly and then rearwardly and outwardly where said concrete-retaining means has an upper wall which is inclined slightly downwardly as well as rearwardly with said concrete-retaining means forming a hollow space capable of receiving concrete, and said concrete-retaining means having at the region where it extends upwardly and inwardly from said plastic backing means a wall structure integral with the concrete-retaining means and defining a groove for receiving an upper edge region of said plastic liner sheet.

3,938,200

CONTAMINATION PREVENTION SYSTEM FOR BATHTUB

Thomas J. Roberts, Elk Grove, and Donald L. Paulson, Rolling Meadows, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 30, 1975, Ser. No. 591,375
Int. Cl.² A47K 13/00
U.S. Cl. 4—173 R **7 Claims**



1. A contamination prevention system to be installed in conjunction with a bathtub in a bathroom of a health-care institution to prevent the various patients that use the bathtub from cross-infecting each other, where the two ends and the back of the bathtub are built into the bathroom walls, comprising:

a series of hooks affixed to the three bathroom walls, surrounding the bathtub, at predetermined spaced-apart locations;

a disposable, flexible, flimsy, water-tight, non-toxic, slip-resistant, biologically-clean, rectangular-shaped liner, made of transparent plastic film, for lining the entire inside of the bathtub, before it is filled with water, to provide a barrier to block the transmission of bacteria between the water and bathtub to preclude cross-infections between patients,

the peripheral edge portions of said liner adjacent to the bathroom walls having a series of openings at predetermined spaced-apart areas to facilitate hanging of said liner from said hooks, said openings being made by using said hooks to pierce said liner, and the peripheral edge portion adjacent to the front of the bathtub being draped thereover;

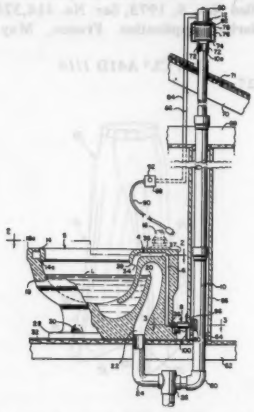
and a series of spaced-apart markers on said liner, each of which corresponds to a respective assigned one of said hooks, to designate the predetermined areas where said liner should be pierced, to make said openings, and hung onto said hooks, thereby aiding the installer in expediting the proper positioning and centering of said liner within the bathtub.

3,938,201

VENTILATOR FOR A TOILET BOWL

Dan McGrew, 533 Crockett St., Grand Prairie, Tex. 75050

Filed Nov. 4, 1974, Ser. No. 520,663
Int. Cl.² E03D 9/04; A47K 13/00
U.S. Cl. 4—213 **5 Claims**



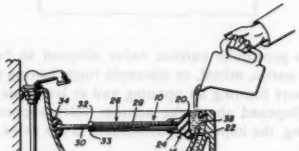
1. Ventilating apparatus comprising a toilet bowl having a manifold formed in the upper rear portion thereof, such that a first end communicates with the inner portion of said toilet bowl and the other end communicates with the exterior rear wall of said toilet bowl; a lip formed above and adjacent the first end of the manifold; a vent stack; coupling means to connect said manifold to the vent stack; a flapper valve element pivotally secured to the interior wall of the coupling means, said flapper valve element being movable toward the vent stack by air pressure; a shoulder to limit the movement of said flapper in a direction away from said vent stack; an exhaust fan secured to the upper end of said stack; a time delay opening switch; conductor means to connect said switch to the exhaust fan; a power source connectable to said switch.

3,938,202

ASSEMBLY FOR CLEANING OVERFLOW PASSAGEWAY IN LAVATORY BOWL

Lucian F. Greer, 1700 N. H St., Midland, Tex. 79701

Filed Aug. 22, 1974, Ser. No. 499,849
Int. Cl.² E03D 11/00
U.S. Cl. 4—255 **10 Claims**



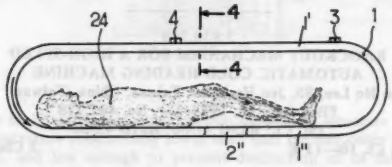
1. An assembly for cleaning the overflow passage in a lavatory bowl comprising a liquid directing cup-like shield and means for fixing said shield about the inlet to the overflow passage adjacent the upper edge of a lavatory bowl, said shield including an upwardly opening liquid receiving portion and a

laterally directed liquid discharging portion for lateral discharge of liquid into an overflow passage inlet.

3,938,203
PATIENT-LIFTER

Robert Linard, Nancy, France, assignor to Societe Anonyme dite: SETIM Societe d'Etudes Techniques des Industries Metallurgiques, France

Filed Nov. 1, 1974, Ser. No. 520,351
Claims priority, application France, Nov. 5, 1973, 73.40209
Int. Cl.² A47B *83/04*
U.S. Cl. 5—81 R **9 Claims**



1. Apparatus for supporting and transferring a patient, comprising:

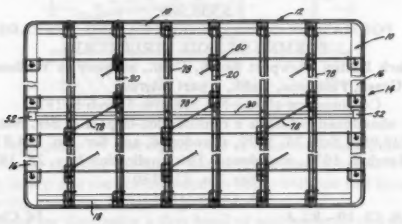
a framework comprising a pair of closed slideway tracks, said tracks being laterally spaced apart and being disposed in parallel generally vertical planes for positioning the tracks in stationary condition on sides of a flat support surface for a patient, the tracks having upper and lower, normally horizontal track portions and having a terminal track portion interconnecting ends of the horizontal track portions; and

flexible stretcher means disposed to be guided by said track portions for positioning the flexible stretcher means, along said lower track portion, between the support surface and the patient to transfer the patient onto and from the flexible stretcher means.

3,938,204
FRAME CONSTRUCTION FOR BOX SPRING ASSEMBLIES

Walter V. Slominski, Ann Arbor, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Apr. 8, 1971, Ser. No. 132,511
Int. Cl.² A47C *23/04*
U.S. Cl. 5—255 **3 Claims**

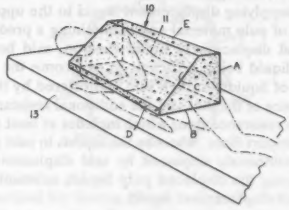


1. A box spring assembly comprising a frame having substantially horizontal side and end rails and a plurality of transversely spaced cross rails supported on and extending between said side rails, each of said cross rails being pre-stressed so that it is longitudinally arched and being secured at the ends thereof to said side rails, the longitudinal arch in a cross rail providing for a location of the center portion thereof above the ends thereof, and a center rail extending transversely of said cross rails and secured at the ends thereof to said end rails, said center rail being connected intermediate the ends thereof to said cross rails and being pre-stressed so that it is longitudinally arched and has the center portions thereof disposed above the ends thereof, a plurality of springs forming a spring assembly of substantially uniform height and having a top deck, and means on said cross rails providing for the support of at least some of said springs thereon in predetermined fixed positions so that the top deck is convexly arched in two directions when viewed from above as a result of said arching of said cross rails and said center rail, said cross rails being generally U-shaped in transverse section and each having a base section and upright leg sections, said base sections being formed with downwardly extending tabs arranged in pairs and aligned with said center rail, and said center rail being interlocked with and arranged between the tabs in each pair.

3,938,205
BODY POSITIONER

Donald C. Spann, 5 Ferncreek Court, Greenville, S.C. 29607

Filed Aug. 19, 1974, Ser. No. 498,399
Int. Cl.² A47C *21/00*
U.S. Cl. 5—327 B **1 Claim**



1. A body positioner for providing lateral support for the body of a patient lying upon an operating table, diagnostic examining table, and the like comprising:

A. an elongated flexible block structure of resilient deformable polyurethane foam material having an unsymmetrical pentagonal cross-section;

B. a first major planar surface carried by said block;

C. a second major planar surface at right angles to said first major surface;

D. a third major planar surface opposite said first and second major surfaces;

E. a first minor planar surface joining said third major surface with said first major surface;

F. a second minor planar surface joining said third major surface with said second major surface;

G. the said structure having a length greater than its width for supporting a substantial portion of the patient's lateral body length extending from about the shoulders to below the waist for increased stability; and

H. one of said minor surfaces having a width greater than the width of the other minor surface;

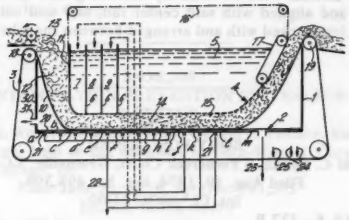
whereby the structure may be variably based on any one of said major surfaces on the table to provide a variety of lateral body support surfaces for adjustably and stably supporting a patient's body in a variety of lateral body positions to obtain a desired patient body position on the table.

3,938,206

METHOD FOR CONTINUOUS DISPLACEMENT WASHING OF LIQUID-CONTAINING PULP MATERIALS

Per Stranger-Johannessen, Minister Ditleffs vei 17a, Oslo 8, Norway

Filed Jan. 8, 1974, Ser. No. 431,734
Claims priority, application Norway, Jan. 10, 1973, 99/73
Int. Cl.[2] D06B *3/02*; D21C *9/02*
U.S. Cl. 8—156 8 Claims



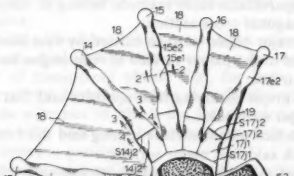
1. A method for the continuous washing of liquid-containing pulp material with a displacement liquid, comprising traversing a filter along a predetermined path, supporting said filter throughout a substantial portion of said path upon a support floor, continuously depositing a mat of liquid-containing pulp material upon said filter for movement therewith, separately supplying displacement liquid to the upper surface of said mat of pulp material and maintaining a predetermined head of said displacement liquid thereon, said head of displacement liquid being sufficient to overcome the resistance to the flow of liquids through said mat offered by the average flow resistance of the mat and the additional resistance to flow offered by a resistance floor which includes at least one of said filter and support floor, whereby the liquids in said pulp material are continuously displaced by said displacement liquid, and recovering the displaced pulp liquids substantially undiluted by said displacement liquid.

3,938,207

SWIMMER'S GLOVE HAVING JOINTS BENDABLE ONLY IN CLOSING DIRECTION OF THE HAND

Gary Clyde Drescher, 1000 Lindbergh Ave., Stroudsburg, Pa. 18360

Filed Oct. 25, 1973, Ser. No. 409,367
Int. Cl.[2] A63B *31/02*
U.S. Cl. 9—308 31 Claims



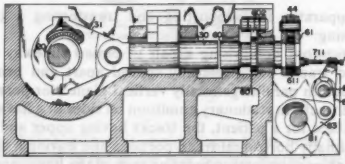
1. A swimmer's glove comprising a hand portion having a palm portion of flexible-non-stretchable material and a back portion, a plurality of partially hollow generally tubular fingers extending from said hand portion in a normal position, joints joining said fingers to said hand portion, one of said fingers being a thumb, at least one joint along each of said fingers other than said thumb outwardly of said hand portion, at least one joint enlargement along each of said fingers other than said thumb outwardly of said and along said thumb outwardly of said joint between said thumb and said hand portion, and flexible webs between adjacent fingers, each joint having a lower portion on the palm side of the glove which is connected with the portions of the glove on either side thereof and having an upper portion projecting at least to the backside of the glove and including means for permitting bending of the joint in the closing direction of the hand and whereby the hand and fingers of the swimmer are reinforced against bending in the opening direction of the hand when force is exerted on the glove from the side toward the closing direction of the hand as the swimmer moves the glove through the water while swimming, and the glove can be bent easily around the lower portions of the joints when the hand of the swimmer is closed.

3,938,208

KNOCKOUT MECHANISM FOR A HIGH-SPEED AUTOMATIC COLD HEADING MACHINE

Yuan Ho Lee, 85, Jen Ho Road, Tainan, China /Taiwan

Filed Aug. 15, 1974, Ser. No. 497,728
Int. Cl.[2] B23G *11/00*; B21D *45/00*
U.S. Cl. 10—11 E 3 Claims



1. A knockout mechanism for a high-speed automatic heading machine comprising:
- a first eccentric shaft adapted to be driven by a source of power;
- a second eccentric shaft;
- a driving link mounted by bearing means on said first eccentric shaft;
- a rocker arm pivotally connected to said driving link at a location spaced from a connection between said driving link and said first eccentric shaft, said rocker arm also being connected to said second eccentric shaft so that when said first eccentric shaft is driven, said rocker arm continuously oscillates; and
- knockout means secured to said rocker arm for ejecting a blank from a die of the heading machine.

3,938,209

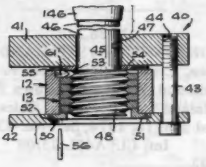
FORMATION OF FASTENERS HAVING THREADS FORMED OF COIL STRUCTURES

Mark Hattan, Newport Beach, Calif., assignor to William P. Green, Pasadena, Calif., a part interest

Continuation of Ser. No. 338,290, March 5, 1973, abandoned, which is a continuation-in-part of Ser. Nos. 229,996, Feb. 28, 1972, abandoned, and Ser. No. 121,817, March 8, 1971, abandoned. This application Nov. 22, 1974, Ser. No. 526,230
Int. Cl.[2] B21D *53/24*
U.S. Cl. 10—86 A 16 Claims

1. The method of forming a composite nut that includes positioning within a case a separately formed helical coil structure which is formed of metal in work-hardened condition and has a radially inner portion shaped to form an internal thread and a radially outer portion with an outer surface proximate the case; directing a high energy beam generally axially along the inner surface of said case and along said outer surface of the coil structure in a relation forming a fusion bond between said case and said radially outer portion of said coil structure; locally heating said radially outer portion of the coil structure by said high energy beam, during formation of said fusion bond, to a temperature locally ad-

versely affecting the work-hardened condition of said radially outer portion; maintaining said internal thread formed by said inner portion of the coil structure in threaded engagement with an external thread on a highly heat conductive heat sink mandrel during said heating; and conducting heat away from said inner portion of the coil structure through the engaged threads of said heat sink mandrel during said heating and at a



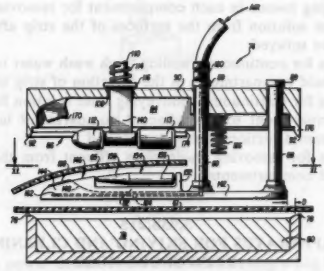
rate maintaining said inner portion of the coil structure at a temperature substantially lower than said radially outer portion, and low enough to prevent destruction of its thread shaped configuration, and to prevent as great an adverse effect if any on the work-hardened condition of said inner portion as on said outer portion, and thereby maintain said inner portion and the thread formed thereby substantially harder than said outer portion.

3,938,210

SCUFF SLIPPER AND METHOD AND APPARATUS FOR THE MANUFACTURE THEREOF

James G. Mitchell; Winalee G. Mitchell, both of Perrysburg, and Paul D. Purdy, Waterville, all of Ohio, assignors to James G. Mitchell and Winalee G. Mitchell, both of Perrysburg, Ohio

Filed Jan. 21, 1975, Ser. No. 542,751
Int. Cl.[2] A43D *00/00*
U.S. Cl. 12—1 W **15 Claims**



1. Apparatus for making slippers of heat-sealable synthetic polymeric sheeting material, said slippers having a sole with heel, instep and toe portions and an upper with toe and instep covering portions, comprising:

means for dispensing a first band of said material of a first width greater than a desired length of said slipper sole;

means for dispensing a second band of said material of a second width narrower than said first width but greater than a desired length of said upper;

a first heat-seaing die having a first perimetral die face configuration at least for said toe portion of said sole;

a second heat-sealing die, disposed opposite said first heat-sealing die, having a second perimetral die face configuration for at least for said toe and instep covering portions of said upper, said first and second perimetral die faces being essentially congruent in shape at least around said instep and toe portions;

means for drawing said first and second bands of material between said first and second heat-sealing dies in a first direction essentially transverse to the length of said perimetral die face configurations, in a position to be contacted simultaneously by by said perimetral die face configurations when said first and second dies are brought together;

means operatively associated with said first and second dies for providing, as measured across said die faces in said drawing direction, a progressively greater length of said second band from the toe portion to the instep portion of said second heat-sealing die face than of said first band from the toe portion to the instep portion of said first heat-sealing die face, when said dies are brought together; and

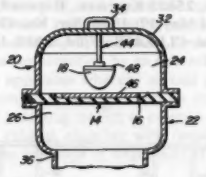
means for bringing said first and second dies together to cause heat-sealing between said first and second bands along at least a portion of said die faces.

3,938,211

FLUID LASTING OF SHOES AND SIMILAR OPERATIONS

Albert Warner Armstrong, 3136 Perry Ave., Bronx, N.Y. 10467

Filed Nov. 27, 1974, Ser. No. 527,743
Int. Cl.[2] A43D *21/00*
U.S. Cl. 12—145 **10 Claims**



10. A method for lasting shoes, comprising the steps of:

a. relieving a portion of an elastic and flexible pad for permitting certain portions of the pad to stretch more than other portions;

b. placing a last adjacent the pad, with the shank area of the last associated with the relieved portion of the pad;

c. attaching an insole to the last;

d. arranging an upper of a shoe between the last and the pad;

e. applying an equal pressure to the pad and causing the pad to surround the last and wipe the upper over edges of the last and into contact with the insole; and

f. securing the upper to the insole while the upper is being wiped over the edges of the last.

3,938,212

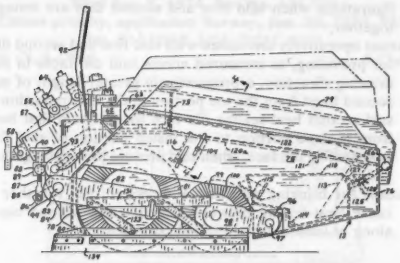
SCRUBBING MACHINE

Keith N. Krier; Neil F. Brown, and Steven J. A. Waldhauser, all of Minneapolis, Minn., assignors to Tennant Company, Minneapolis, Minn.

Division of Ser. No. 255,612, May 22, 1972, Pat. No. 3,824,645. This application July 19, 1974, Ser. No. 490,206
Int. Cl.[2] A47L *11/292*
U.S. Cl. 15—50 C **7 Claims**

1. A maintenance machine for surfaces such as a floor or the like comprising a vehicle having ground engaging wheels, a frame having a downwardly opening enclosure, means mounting the frame on the vehicle, a power driven rotary maintenance tool, first means for rotatably mounting the tool on the frame to extend within the enclosure, a receptacle within the enclosure to recieve material raised by said tool, said frame having a deflector in overhanging relationship to said tool and receptacle that slopes downwardly toward the receptacle for directing liquid raised by the tool and collecting

on the deflector surface to roll along the surface and drip into said receptacle, means for mounting the receptacle on the frame for movement between a liquid collecting position and a liquid dumping position to empty liquid in direction away



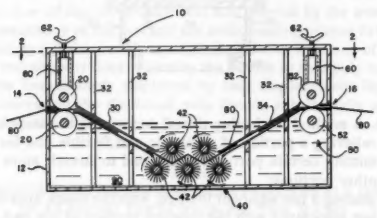
from the vehicle and means on the frame for releasably retaining the receptacle in the liqud collecting position, said receptacle having a center of gravity located to constantly urge the receptacle to move to its dumping posiition.

3,938,213

SCORECARD WASHING DEVICE

Dominic DiFede, 25803 Kay Ave., Hayward, Calif. 94545

Filed May 17, 1974, Ser. No. 470,710
Int. Cl.² A46B *13/04*; B08B *1/02*
U.S. Cl. 15—77 **1 Claim**



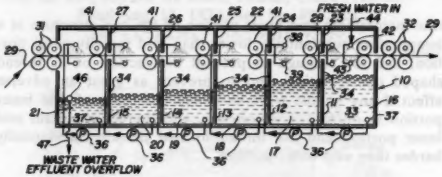
1. A device for washing and drying scorecards comprising;
a tank having an inlet aperture and an outlet aperture;
means for conveying a scorecard edgewise through said tank, said conveying means including in part a pair of revolving feeder rollers located at said inlet aperture which receive and pull said scorecard into said tank and propel it through a guide means downward into a cleaning fluid disposed in said tank;
a scrubbing station submerged in the cleaning fluid contained in said tank whereby said fluid is supplied to the scorecard during the scrubbing operation, said scrubbing station including multiple revolving cylindrical brushes positioned above and below said scorecard to receive it from said feeder rollers and to propel it as it passes through said scrubbing station, said brushes being disposed in a vertically staggered arrangement which causes the scorecard to undulate as it passes through the brushes and whereby both sides of said scorecard are washed simultaneously, said brushes positioned above said scorecard revolving in a direction opposite to said brushes positioned below said scorecard and propelling said scorecard through said scrubbing station to a second guide means and through said second guide means to a drying station;
means for drying said scorecard at said drying station comprising a pair of revolving wringer rollers operable to remove said fluid from said scorecard and pull it from said scrubbing station and propel it through said outlet aperture;
means for adjusting the compressive tension of said feeder rollers and said wringer rollers upon said scorecard as it passes between said pairs of rollers; and
means for simultaneously revolving said feeder rollers, cylindrical brushes and wringer rollers whereby said scorecard is continuously conveyed through the machine throughout the washing and drying operation.

3,938,214

CASCADE RINSING SYSTEM AND METHOD

John B. Hodsden, Crown Point; James V. Middleton, Highland, and Edmund W. James, Crown Point, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Jan. 14, 1974, Ser. No. 431,304
Int. Cl.² A47L *25/00*
U.S. Cl. 15—102 **10 Claims**



1. A cascade rinsing system for rinsing a continuously moving steel strip following a pickling operation or the like, said system comprising;
a plurality of rinse compartments arranged consecutively in the direction of travel of said strip, each compartment being adapted to contain a bath of aqueous rinse solution;
spray means located above the bath in each compartment for spraying the surfaces of strip passing therethrough;
means for continuously supplying rinse solution from the bath contained in each compartment to the spray means associated with said compartment for use in spraying said strip;
wringing means in each compartment for removing excess rinse solution from the surfaces of the strip after it has been sprayed;
means for continuously adding fresh wash water to the last of said compartments in the direction of strip travel;
means for continuously conveying rinse solution from each compartment to the adjacent compartment in the upstream direction of strip travel; and
means for removing waste rinse effluent from the first of said compartments.

3,938,215

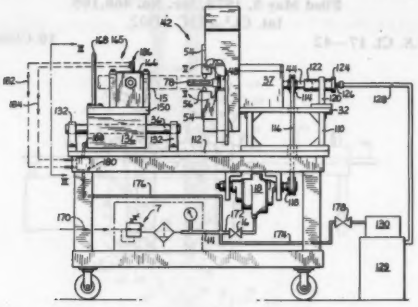
APPARATUS FOR SKIVING AND CLEANING REINFORCED HOSE

Michael L. Anderson, Marquette Heights; Harold W. Folwer, Brimfield, and David A. McKie, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 378,718, July 12, 1973, Pat. No. 3,820,421. This application Feb. 19, 1974, Ser. No. 443,711
Int. Cl.² A47L *5/38*
U.S. Cl. 15—304 **6 Claims**

1. A machine for cleaning the inner portion of a reinforced hose comprising; hollow mandrel means for receiving and supporting said hose during cleaning, clamping means for clamping said hose to be cleaned in a fixed position with respect to said clamping means, travel means for supporting said clamping means and for selectively moving said clamping means and said hose longitudinally toward said hollow mandrel means, a source of vacuum, communication means for communicating said source with said hollow mandrel means and opening means for communicating the interior of said hollow mandrel means with said inner portion of said rein-

forced hose for vacuum cleaning thereof, said clamping means including gripping means for holding said hose fixed in said clamping means while said clamping means moves longitudinally toward said mandrel means and while said hose is received upon said mandrel means, said gripping means comprising opposed movable members having irregular gripping surfaces for engaging said hose, motor means for actuating at least one of said movable members towards the other of said movable members.

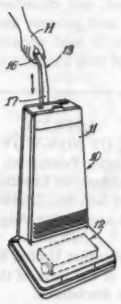


3,938,216

HANDLE MOUNTING MEANS FOR POWER DRIVEN VACUUM CLEANER

Joseph F. Schmitz, St. Paul; Ute K. Malz, Afton, and Erwin Nordeen, St. Paul, all of Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 10, 1975, Ser. No. 548,408
Int. Cl.[2] A47L 5/00; B62D 1/00
U.S. Cl. 15—340 18 Claims



1. In a power driven vacuum cleaner having a bag housing, selectively operable means for reversibly driving the vacuum cleaner, and a manipulating handle, an improved mounting structure for movably mounting the handle for controlling the selectively operable means, said mounting structure comprising:

bearing means movably supporting said handle on said bag housing for reciprocable movement of the handle from and to a central neutral position; and

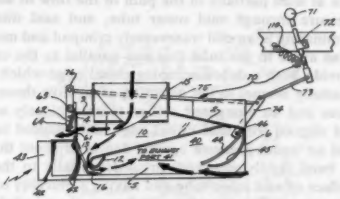
a biasing assembly for biasing said handle to said neutral position including stop means fixedly retained to said bag housing, means movable with said handle defining a pair of reaction surfaces spaced oppositely from said stop means, a first selectively deflectible spring extending between said stop means and one of said reaction surfaces, and a second selectively deflectible spring extending between said stop means and the other of said reaction surfaces, said springs cooperatively urging said handle to said central neutral position.

3,938,217

SURFACE CLEANING PICKUP HEAD

Jack L. Hommes, Muskegon, Mich., assignor to Clarke-Gravely Corporation, Muskegon, Mich.

Filed Nov. 5, 1973, Ser. No. 412,668
Int. Cl.[2] A47L 5/14
U.S. Cl. 15—346 17 Claims



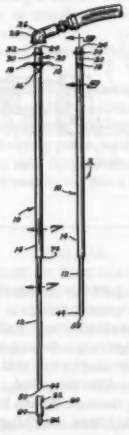
1. A surface cleaning apparatus comprising: a pickup head defining an exhaust chamber; an air delivery flow circuit operably connected to said exhaust chamber for delivering air under pressure to said exhaust chamber; an air exhaust circuit operably connected to said exhaust chamber for exhausting air therefrom; a vent on said air delivery circuit for venting said air delivery circuit to the atmosphere, said vent being located outside of said exhaust chamber and on the upstream air flow side thereof; said vent being sufficiently large to vent a substantial portion of air under pressure to the atmosphere; closure means on said vent; actuating means operably connected to said closure means and being conveniently located on said apparatus for actuation by an operator operating said surface cleaning apparatus whereby as said pickup head approaches large items of debris, the operator can open said vent by actuating said actuating means, to create a greater negative pressure in said exhaust chamber with respect to the atmosphere whereby the ingestion of large items of debris and litter is facilitated.

3,938,218

EXTENSIBLE CLEANING TOOL

Ferdinando DeAmicis, 6401 Oliver Ave. South, Richfield, Minn. 55423

Filed Nov. 7, 1973, Ser. No. 413,432
Int. Cl.[2] A47L 9/06
U.S. Cl. 15—401 9 Claims



9. A telescoping cleaning tool adapted to remove debris from timing adjustment scales of an automobile and comprising:

a. an outer tube having open ends of which one is adapted to receive air under pressure from a pressure-actuatable nozzle;

b. an inner tube fitted within said outer tube in sliding engagement therewith, said inner tube having proximal and distal ends with respect to the air-receiving end of the outer tube, said proximal end terminating in an end surface at least partially in the path of the flow of air under pressure through said outer tube, and said distal end terminating in an end transversely crimped and machined at an angle to the tube axis and parallel to the crimp to provide both a debris-scraping chisel edge which is substantially normal to the direction of air flow through said tubes and an elongated orifice therein closely adjacent and aligned with said chisel edge and adapted to direct said air under pressure against debris adjacent the edge;

c. A band rigidly attached circumferentially to the outer surface of said inner tube and having a plurality of spring strips extending therefrom substantially parallel to the direction of air flow, each spring strip being sinuously curved so as to alternately contact juxtaposed walls of the inner and outer tubes to restrain movement tending to displace the coaxial alignment therebetween;

the end of said outer tube opposite said air-receiving end being turned inwardly about its periphery to an extent just sufficient to restrain passage to said band therethrough, said outer tube further having a handle extending laterally outwardly adjacent the air-receiving end thereof and adapted to be held by the fingers of one hand as the palm of that hand urges a pressure-actuated air nozzle into engagement with said air-receiving end.

3,938,219

HINGE MOUNTING DEVICE

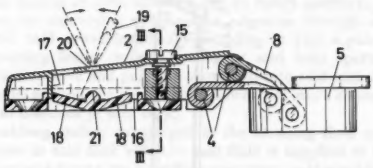
Erich Rock, Hochst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Blum Gesellschaft m.b.H., Hochst, Austria

Filed Oct. 7, 1974, Ser. No. 512,883

Claims priority, application Austria, Oct. 10, 1973, 8639/73; Feb. 26, 1974, 1567/74; Mar. 29, 1974, 2635/74; Apr. 2, 1974, 2745/74

Int. Cl.² E05D 7/04

U.S. Cl. 16—130 **21 Claims**



1. A hinge mounting device, particularly for use with furniture doors, said device comprising:

a mounting plate attachable to a wall of a piece of furniture to extend in a depthwise direction thereof;

a slide piece slidably attached to said mounting plate to slide in said depthwise direction; and

a hinge arm having thereon means for connection to a door of said piece of furniture, said hinge arm having a first end and a second end with respect to said depthwise direction, said first end being fixed to said slide piece, and said second end being slidably attached to said mounting plate to slide in said depthwise direction.

3,938,220

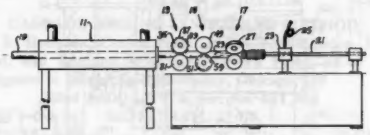
ZONE REGULATION OF CASING INFLATION GAS

Arthur L. Sheridan, Woodridge, and Walter V. Marbach, Palos Heights, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 468,105

Int. Cl.² A22C 11/02

U.S. Cl. 17—42 **10 Claims**



1. In a system for the production of flexible film tubing which system includes means for continuously introducing an inflation gas into the interior of the tubing and means for continuously unidirectionally advancing the tubing from a first zone to a second zone, apparatus to maintain a preselected inflation gas pressure differential between the first zone and the second zone comprising, in combination:

A pair of nip rolls disposed in selectably adjustable tube flattening nipping contact on the continuously advancing tubing, at least one of the rolls of said pair having a circumferential surface provided with alternate lands and grooves extending transversely on the width of its circumferential surface, and means to continuously selectably vary the contact pressure exerted on the advancing tubing by said pair of nip rolls, whereby a continuous succession of selectably variable volume inflation gas accumulation chambers is formed, one chamber at a time, in the advancing tubing in said grooves and the successive inflation gas quantities in said accumulation chambers are passed from one of said zones to the other.

3,938,221

MANUFACTURE OF NON-WOVEN MATERIALS

Ronald Edmund Ricketts, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 73,888, Sept. 21, 1970, Pat. No. 3,763,521. This application Aug. 20, 1973, Ser. No. 389,547

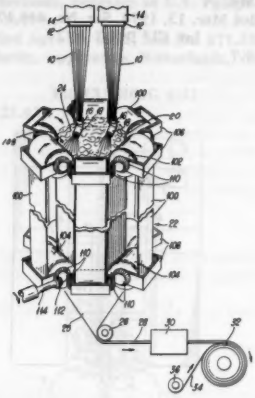
Claims priority, application United Kingdom, Oct. 1, 1969, 48196/69. The portion of the term of this patent subsequent to Oct. 9, 1990, has been disclaimed.

Int. Cl.² D01G 5/00

U.S. Cl. 19—155 **6 Claims**

1. Apparatus for making a non-woven web comprising filament supply means, two or more filament forwarding means and a filament collector, said collector comprising a plurality of vertically arranged continuous belts which are arranged side-by-side so as to define a vertical channel, the inner wall of which provides a collection surface for said filaments, the exit passage at least of said forwarding means being inclined at an angle to the axis of the channel, and means causing preferably uniform relative angular motion between said forwarding means and said channel such that the mean distance between said forwarding means and the surface of said channel remains substantially constant while ensuring that the overall relative angular motion between filament supply means and the inlets at least of the filament forwarding means is at least substantially zero, said forwarding means including a plurality of air injectors mounted upon a tilted non-rotatable plate and means for causing the plane of the tilt of said plate to proceed at a uniform angular velocity, so that

said filaments are projected on to said collection surface to form a non-woven web, and means causing said belts to be



driven in continuous synchronous manner to convey said non-woven web away from said filament forwarding means.

3,938,222

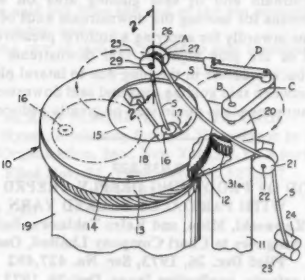
TRACKING GUIDE FOR PLANETARY COILER

Joe Kent Garrison, Piedmont, S.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Filed Oct. 7, 1974, Ser. No. 512,450

Int. Cl.[2] B65H *54/76*

U.S. Cl. 19—159 R **3 Claims**



1. A tracking device for delivering sliver to a planetary coiler, having drive means, and coiler sliver guide means movable in a predetermined arcuate path responsive to said drive means, for delivering sliver in a predetermined pattern for collection in a sliver can comprising:

a rotatable guide over which said sliver is fed for delivery to said coiler sliver guide means;

a vertical standard driven for rotation by said drive means;

a horizontal offset arm carried adjacent a top of said standard;

means mounting said rotatable guide on said arm for rotation on a horizontal axis in substantial alignment with said sliver and above and in substantial alignment with said coiler sliver guide means; and

gear means driven by said vertical standard moving said means mounting said rotatable guide in a path approximating the arcuate path of said coiler sliver guide means;

whereby substantially even tension is exerted at all times on said sliver avoiding attenuation thereof causing thin places in the sliver.

3,938,223

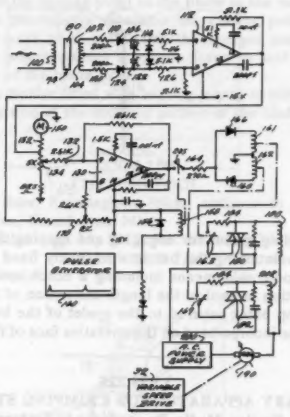
AUTO LEVELER

Karl R. Grice, Honea Path, S.C., assignor to Fiber Controls Corporation, Gastonia, N.C.

Filed Jan. 6, 1975, Ser. No. 538,875

Int. Cl.[2] D01H *5/38*

U.S. Cl. 19—240 **8 Claims**



1. An apparatus for maintaining the density of sliver strands substantially uniform comprising:

sensor means having a pair of sensor members mounted for continuously passing therebetween a sliver so that one of the members moves as a function of sliver density,

core means coupled to said one member for movement therewith,

transformer means having a primary coil and first and second secondary coils coupled by said core means so that the amplitude of the output voltages by said secondary coils varies as a function of the position of said core means,

differential amplifier means connected to said transformer means for producing a signal which varies as a function of the difference in amplitude between the voltages at said secondary coils,

pulse generator means for producing a series of activating pulses,

further amplifier means connected to said pulse generator means and said differential amplifier means for producing an amplified output only when the pulse generator is producing an activating pulse, and

means connected to said further amplifier means for causing the sliver thickness to vary as a function of said amplified output.

3,938,224

DEVICES FOR USE IN THE MANUFACTURE OF ARTICLES OF UPHOLSTERY

Regis J. Delahousse, Meze-sur-Louet, and Philippe J. Delahousse, Brissac-Quince, both of France, assignors to Etablissements Delahousse et Bruant, Brissac-Quince, France

Filed Jan. 16, 1974, Ser. No. 433,798

Claims priority, application France, Jan. 16, 1973, 73.01478

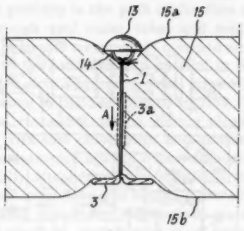
Int. Cl.[2] A44B *1/24*

U.S. Cl. 24—102 T **8 Claims**

1. A device for use in the production of an upholstered article for securing a button having an eyelet thereon to the face of the article, said device comprising

flexible means defining a loop having a length less than the uncompressed thickness of the article to be upholstered, and

a thin elongated flat and relatively straight bar adapted to be inserted through the eyelet of the button; said bar



including means for engaging and nipping the loop and for maintaining the bar in a relatively fixed position on the loop, said means including a notch extending in a direction normal to the length dimension of the bar,

said loop being secured to the eyelet of the button which will be incorporated on the operative face of the article.

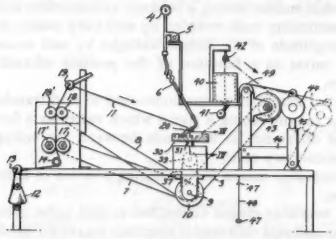
3,938,225
ROTARY APPARATUS FOR CRIMPING STRANDS

Robert K. Stanley, Media, Pa., assignor to Textured Yarn Co., Inc., Kennett Square, Pa.

Continuation of Ser. No. 376,567, July 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 176,029, Aug. 30, 1971, Pat. No. 3,781,951. This application Sept. 3, 1974, Ser. No. 502,493.The portion of the term of this patent subsequent to Jan. 1, 1991, has been disclaimed.

Int. Cl.² D02G 1/12

U.S. Cl. 28—1.6 **5 Claims**



1. Strand-crimping apparatus comprising a cylindrical strand-receiving chamber within which the strand undergoes sufficiently forcible lengthwise impact against a wall thereof to buckle it into crimped configuration, including a foraminous cylindrical wall and a pair of relatively flat walls parallel to one another and perpendicular to and flanking the foraminous cylindrical wall, one of the walls having a central opening therethrough, means for propelling a strand to be crimped into and means for withdrawing it crimped from the chamber through the opening, means for rotating the chamber about the axis thereof, and including also separable ring-shaped means adjacent the flat outside of the wall having the central opening therein and adapted to receive crimped strand therebetween in crimp-dephasing rubbing contact therewith upon withdrawal thereof from the chamber, wherein the strand-propelling means and strand-withdrawal means are adapted to forward the strand at relatively fast and slow rates, respectively, whereby the strand piles up temporarily in crimped form therebetween inside the chamber.

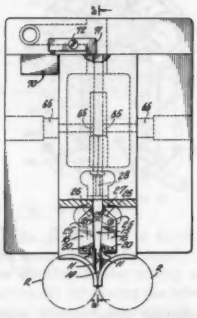
3,938,226
APPARATUS FOR CRIMPING YARN

John S. Roberts, Ellicott, Md., assignor to Kling-Tecs, Inc., Columbia, Md.

Filed Mar. 13, 1974, Ser. No. 446,175

Int. Cl.² D02G 1/12

U.S. Cl. 28—1.7 **8 Claims**



1. A crimping head; including means for feeding a yarn end therein and for forming a plug of yarn therefrom, said head comprising a crimp site and plug guiding area of relatively short length defined in part by opposing surface means spaced apart a predetermined distance for contacting opposite sides of the plug for substantially establishing the lateral width of the plug and for guiding the plug downstream, pressure means mounted laterally outwardly of and extending downstream of the downstream end of said guiding area on either side thereof, means for moving the downstream ends of said pressure means inwardly for applying a uniform pressure on opposite sides of the plug adjacent said downstream ends only whereby back pressure in the plug due to lateral plug-surface friction between said guiding area and said downstream end of said pressure means is minimized or greatly reduced.

3,938,227
METHOD OF PRODUCING DEEPLY CREPED FABRIC WITH PARTIALLY BULKED YARN

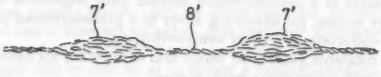
Kentaro Kawasaki, Mino, and Keizo Takizawa, Suita, both of Japan, assignors to Chori Company Limited, Osaka, Japan

Filed Dec. 26, 1973, Ser. No. 427,492

Claims priority, application Japan, Dec. 29, 1972, 47-1859

Int. Cl.² D06C 23/04

U.S. Cl. 28—72 FT **6 Claims**



1. A method of producing a deeply creped fabric comprising imparting an increased number of twists to a partly bulked yarn prepared from a twisting, heat-setting, untwisting process whereby the partly bulked yarn has bulked portions and non-bulked portions arranged alternately along the length of the yarn wherein the number of twists are increased mostly in the non-bulked portions of the yarn thereby making the difference between the bulked and non-bulked portions conspicuous and providing increased retractability for the yarn and manufacturing a fabric from the yarn with the additional twists and subjecting the fabric to a creping treatment.

3,938,228

METHOD OF MAKING A CAPACITOR HOUSING

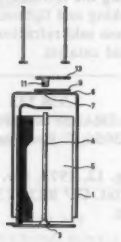
Pieter Kemkers, and Antonius Lambertus Derks, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,539

Claims priority, application Netherlands, May 1, 1974, 7405803

Int. Cl.² H01G 4/32

U.S. Cl. 29—25.42 6 Claims



1. A method of providing a metal, electrical terminal in an end face of a cylindrical metal capacitor housing, containing a capacitor body with at least two electrodes, one of the electrodes being electrically connected to the capacitor housing, the other electrode being electrically connected to the terminal electrically insulated from the capacitor housing, comprising the steps of

providing a capacitor housing end face made of metal and at least partly covered by an electrically insulating foil;

pushing a portion of said foil through an opening in said end face by means of a pin, thereby providing said terminal through and insulated from said end face;

removing said foil from the end of the pin pressed through said opening; and

connecting one of said electrodes to said terminal.

3,938,229

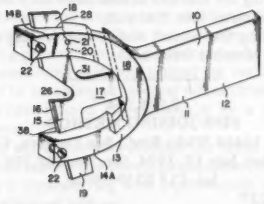
SCREW MACHINE CUT-OFF TOOL

Charles P. Hynes, Rockaway Park, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.; a part interest

Filed Nov. 26, 1974, Ser. No. 527,217

Int. Cl.² B26D 1/00

U.S. Cl. 29—96 2 Claims



1. A screw machine cut-off tool in which the cutting point of the tool blade is supported in tension, comprising

a removable tool blade, formed with two arm sections joined to a stiffener section,

a blade holder formed with a shank joined to two separated arm members, with fastening means to frictionally mount each arm member of the blade holder to an arm section of the blade,

said tool blade fitted with a cutting point located between the two arm sections of the blade with the stiffener section extending from the rear portion of the blade opposite the cutting point on the forward end of the blade,

said blade holder and said blade fitted with adjustable mating means to positively engage a first arm member of the blade holder with a first arm section of the blade, with the second arm member of the blade holder being frictionally engaged to the second arm section of the blade,

said first arm section of the blade being oriented with respect to the cutting point of the blade in the same direction as the relative direction the cutting point moves toward work to be cut so that the engaged positive said mating means applies a tension force to said first arm section of the blade in use,

said blade holder fitted with bearing means to slidably support the end of the stiffener section of the blade.

3,938,230

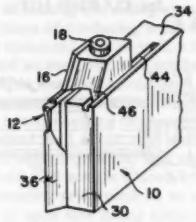
CUTTING TOOL

Gordon L. Rice, Farmington, Mich., assignor to Posa-Cut Corporation, Farmington, Mich.

Filed Aug. 11, 1975, Ser. No. 603,674

Int. Cl.² B26D 1/00

U.S. Cl. 29—96 1 Claim



1. In a cutting tool having a horizontally elongated, rectangular in cross-section tool holder having a front face, a vertical side face, and an upper face;

an upwardly opening V-shaped recess cut into said side face and forming a flat, vertical recess wall parallel to, but spaced inwardly of the plane of said side face, with one leg of the V extending upwardly and forwardly of the tool holder and terminating at said front face considerably below said upper face so that the recess is open forwardly as well as upwardly and sidewise, and with the other leg of the V extending upwardly and rearwardly of the tool holder and terminating at said upper face;

the edges defining said legs each being flat and uniformly sloped inwardly to form in cross-section a continuous, uniform acute angle inside the recess between the flat recess wall and said edges so that the recess gradually widens from the tool holder vertical side face towards the recess wall;

a replaceable cutting tool insert formed of a flat, substantially equilateral triangular shaped plate of hard, brittle metal, each of whose corners forms a cutting tip;

the improvement wherein the three edges of the insert are tapered and bevelled outwardly at an acute angle from its opposite faces and terminate in a central elongated ridge along each side, said angle corresponding to the shape of the edges defining said legs; whereby said insert is adapted for selective use in right and left hand tool holders;

said edges defining said recess legs being approximately as wide as the thickness of the insert and the two legs intersecting an at angle substantially equal to the angles of intersections between the edges of the cutting tool insert;

said insert being vertically arranged within the recess with said one of its faces in full face to face contact with said recess wall and with the one tapered sides of two of its edges in full face to face contact with the full length of the two edges defining said legs for a portion of the depth of

said recess and with one corner thereof being exposed and extending forwardly of the tool holder front face;

a downwardly opening releasable clamp member secured to said upper face and having a narrow clamping edge forming a narrow line contact with the outer tapered upper one edge of the insert, wherein said insert is jammed downwardly and towards and against the recess wall by the clamp and the cooperating sloped and bevelled edges and cutting forces applied to said exposed corner;

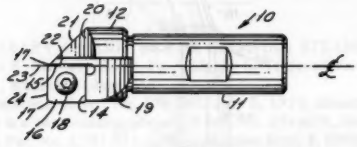
and whereby said insert may be released and rotated to successively expose each corner as the corners wear out and may be replaced with a new insert of approximately the same thickness and edge lengths, so that inaccuracies and slight variations of size of the inserts are accommodated by the inserts extending a variable distance outwardly or inwardly of the side, upper and forward openings of the recess.

3,938,231

CENTER CUTTING END MILL

David Alan Hopkins, Detroit, Mich., assignor to The Valeron Corporation, Detroit, Mich.

Filed Mar. 11, 1975, Ser. No. 557,397
Int. Cl.² B26D 1/12
U.S. Cl. 29—103 A 17 Claims



1. An indexable insert center cutting end mill comprising;

a shank,

a pocket at one end of said shank formed for locating an indexable, polygonal insert,

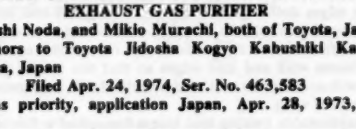
said pocket having wall means for locating said insert with a cutting edge extending radially, with an inactive radially innermost edge and with the axis of said end mill intersecting an intermediate briding corner joining said edges.

3,938,232

METHOD OF MANUFACTURING CATALYST TYPE EXHAUST GAS PURIFIER

Fumiyoshi Noda, and Mikio Murachi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 24, 1974, Ser. No. 463,583
Claims priority, application Japan, Apr. 28, 1973, 48-049505
Int. Cl.² B21D 53/00
U.S. Cl. 29—157 R 4 Claims



1. Method of manufacturing a catalyst type exhaust gas purifier, which method comprises the steps of:

placing one side of the catalyst near the inner surface of one part of a divisible vessel;

positioning the other part of said divisible vessel near the opposite side of said catalyst while inserting packing means between said parts which keeps said parts separated;

said catalyst being smaller than said vessel so that a space is also left between said vessel and catalyst;

charging a castable refractory into the space between said vessel and catalyst;

solidifying and firing the refractory; and

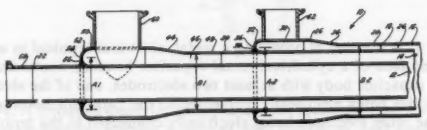
removing said packing and tightening the two parts of said vessel to compress said refractory, which has some elasticity, against said catalyst.

3,938,233

HEAT TRANSFER APPARATUS

Robert B. Cannon, 3056 E. Rocklyn Road, Springfield, Mo. 65804

Filed Aug. 12, 1974, Ser. No. 496,398
Int. Cl.² B23P 15/26
U.S. Cl. 29—157.3 R 4 Claims



1. The method of assembling a header for a heat transfer apparatus having a plurality of longitudinally extending, concentrically mounted heat transfer tubes including an outer tube having a first end, an intermediate tube having a first end extending longitudinally beyond said outer tube first end and an inner tube having a first end extending longitudinally beyond said intermediate tube first end, said method comprising the steps of:

a. welding a band member about said intermediate tube, said band member extending radially outwardly along a sanitary radius from said intermediate tube to a free end;

b. cleaning and polishing the band so as to form a smooth continuation of the sanitary radius blending into the intermediate tube;

c. forming an outer tube sealing member comprising a section of tubing of increasing diameter having a first end with a diameter equal to the diameter of said outermost tube and a second end defined by a radially inwardly directed sanitary radius;

d. butt welding the first end of said outer tube sealing member to said outer tube first end;

e. butt welding the second end of said sealing member to said band member free end.

3,938,234

PIPE JOINING METHOD

George Price, 14444 Wicks Blvd., San Leandro, Calif. 94577

Filed July 15, 1974, Ser. No. 488,796
Int. Cl.² B23P 19/04
U.S. Cl. 29—237 4 Claims

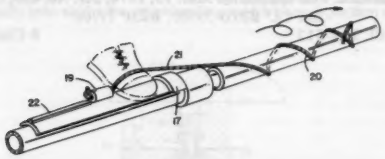
1. An apparatus for rotating a first pipe section while translating the first pipe section into the coupling end of a second pipe section, comprising:

a first member adapted to be supported on the second pipe section and extending longitudinally along the same,

a second member extending flexibly from said first member and releasably secured in convoluted form to said first pipe section, and

lever means for tensioning and pulling said second member toward said first member, said first member including a longitudinally extending track for supporting and guiding

said lever means, said lever means including an element for releasably engaging an end portion of said second member whereby movement of said lever effects rotation



of said first pipe section and axial movement thereof towards and into said coupling end of said second pipe section.

3,938,235

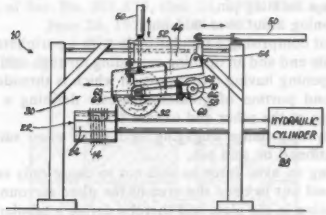
METHOD FOR SEVERING RINGS FROM A COIL

William H. Wendt, III, River Forest, and George D. Krieps, Glenwood, both of Ill., assignors to Chicago Metal Mfg. Co., Chicago, Ill.

Division of Ser. No. 341,304, March 14, 1973, Pat. No. 3,878,654. This application Oct. 17, 1974, Ser. No. 515,535

Int. Cl.² B23P *17/00*

U.S. Cl. 29—412 **1 Claim**



1. A method of forming rings of a predetermined internal circumference, comprising the steps of

coiling resilient bar stock into a resilient helical coil having a plurality of turns with an internal circumference corresponding generally to said predetermined circumference,

forcibly expanding said coil against the resilient resistance thereof to an enlarged internal circumference exceeding said predetermined circumference by a predetermined increment,

forming a cut across and through the turns of said coil at one point around the circumference thereof to sever each turn as a separate ring with a gap therein equal in width to the width of said cut,

said cut being formed with a substantial width which is equal to said predetermined increment,

relaxing the expansion of said rings to allow return movement thereof by their own resilience to said predetermined internal circumference,

said gap in each ring being closed by such return movement thereof,

removing the helical pitch of each ring by flattening it into a single plane and thereby bringing the severed ends of said ring into alignment,

and welding said severed ends of each ring together.

3,938,236

METHOD OF MANUFACTURING BRUSHING APPARATUS

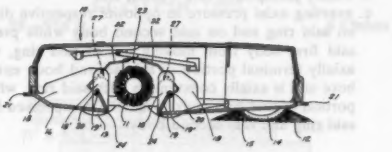
Guenter Leifheit, Nassau, Germany, assignor to Leifheit International Gunter Leifheit Gmbll, Nassau, Germany

Division of Ser. No. 302,590, Oct. 31, 1972, Pat. No. 3,815,167. This application Jan. 17, 1974, Ser. No. 433,341

Claims priority, application Germany, Nov. 5, 1971, 2154971

Int. Cl.² A47l *11/08*

U.S. Cl. 29—434 **4 Claims**



1. In a method of making a brushing apparatus for carpets and the like, the steps of producing a dirt-collecting trough having at least an elongated bottom wall, a longitudinal wall, transverse walls and an open top, said producing step including initially forming at least said bottom wall and said longitudinal wall in a flat condition in a common plane and with a flexible wall zone interconnecting the same, and displacing at least said longitudinal wall about said wall zone so that a marginal portion of said longitudinal wall which is parallel to and distant from said wall zone is spaced from said common plane; pivotally mounting said trough on an axle supported in a housing having an open side facing toward a surface to be brushed so that said open top faces oppositely of said open side, engaging said marginal portion of said longitudinal wall permanently with said axle to form a partial bearing for pivoting movement of said longitudinal wall about said axle and to retain said longitudinal wall against movement into the plane of said bottom wall; and installing at least one brush roller in said housing laterally adjacent said trough and projecting in part from said open side of said housing.

3,938,237

METHOD OF SECURING TUBULAR BELLOWS TO A CYLINDER

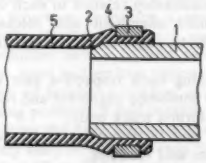
Erwin Dunz, Schweinfurt am Main, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed July 17, 1974, Ser. No. 489,387

Claims priority, application Germany, Aug. 7, 1973, 2339838

Int. Cl.² B23P *11/02*

U.S. Cl. 29—450 **10 Claims**



1. A method of securing a yieldably resilient first body to a second cylindrical body more rigid than said first body, said bodies having respective axes, and said first body being formed with an axial bore therethrough of smaller cross section in the relaxed condition of said first body than the cross section of said second body, which method comprises:

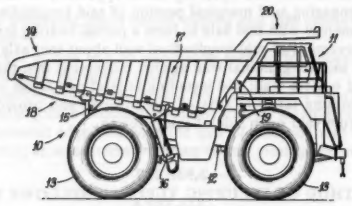
a. inserting said first body in a clamping ring more rigid than said first body;
1. the internal cross section of said ring being greater than said cross section of said second body, but not substantially greater than the outer cross section of said first body,
2. said first body being inserted into said ring until an axially terminal portion of said first body projects beyond said ring,
3. said portion of said first body being formed with an orifice of said bore, and said second body entering said orifice under said exerted axial pressure;
b. axially juxtaposing said bodies; and
c. exerting axial pressure in opposite respective directions on said ring and on said second body while preventing said first body from moving out of said ring, until an axially terminal portion of said second body enters said bore and is axially coextensive with said ring, whereby a portion of said first body is radially compressed between said ring and said second body.

3,938,238

METHOD FOR MAKING A MODULAR TRUCK BODY

Samuel L. Kershaw, and Bernard E. Proeschl, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 472,709, May 23, 1974. This application Nov. 18, 1974, Ser. No. 524,994
Int. Cl.² B23P *21/00*
U.S. Cl. 29—469 **6 Claims**



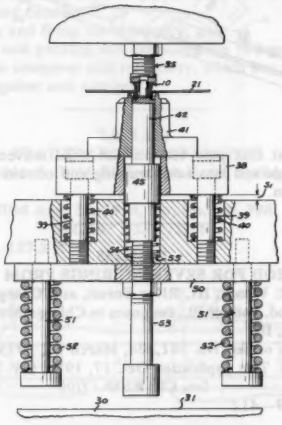
1. A method for making a truck body comprising the steps of
prefabricating a plurality of individual truck body modules,
pre-assembling said modules together and retaining them in pre-aligned relationship relative to each other,
securing combined alignment and releasable fastening means adjacent to edges of each respective pair of said modules,
releasably attaching each respective pair of modules together by said combined alignment and releasable fastening means to form a truck body,
releasing all of said fastening means to disassemble said truck body into said modules,
shipping said modules to a remote location,
re-assembling said modules together into said pre-aligned relationship,
again attaching each respective pair of modules together by said combined alignment and releasable fastening means to re-form said truck body, and
welding said modules together to form a structurally integrated truck body.

3,938,239

METHOD OF FORMING A SELF-FLANGING NUT JOINT

Corliss Lauth, Windsor, Canada, assignor to Lauth Fasteners Limited, Windsor, Canada

Continuation-in-part of Ser. No. 360,147, May 14, 1973, abandoned. This application Mar. 13, 1974, Ser. No. 450,730
Int. Cl.² B21D *39/00*; B23P *11/00*
U.S. Cl. 29—512 **8 Claims**



6. The method of forming a nut joint which comprises
positioning a sheet metal plate having an opening therein over a locating pin,
positioning a nut over said pin,
said nut comprising a tubular body with a peripheral flange at one end and an opening extending through said body,
said opening having a first portion which is threaded and a second portion of greater diameter defining a riveting flange at the other end of said body,
said riveting flange engaging said plate when said nut is positioned on said pin,
applying an axial force to said nut to cause only said body of said nut to bend the area of the plate surrounding the opening in the plate and thereby define a tubular portion on the plate without substantially changing the cross sectional thickness of the plate,
continuing the application of force until the end of the nut having the flange thereon is substantially flush with the remainder of the plate,
and thereafter applying an oppositely directed axial force to the riveting flange portion of said nut to deform said portion radially outwardly into engagement with the end of the tubular portion that has been formed in the plate.

3,938,240

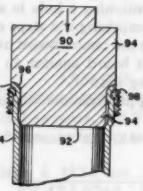
METHODS OF PROVIDING A TUBE WITH A THREAD RING

Robert Stuart Holden, 24 Coleman Road, Glastonbury, Conn. 06033

Division of Ser. No. 409,153, Oct. 24, 1973, abandoned. This application Mar. 5, 1975, Ser. No. 555,682
Int. Cl.² B21D *39/00*; B23P *11/00*
U.S. Cl. 29—512 **4 Claims**

1. A method of making a tube having at least one free edge portion formed at one end thereof, said tube having at least one T-shaped projection formed thereon adjacent said free edge, said projection being located with the cross bar thereof extending generally parallel to said free edge and the stem thereof extending from said cross bar towards said free edge and terminating at an end spaced from said free edge; and an annular ring having a threaded outer peripheral surface and an

inner surface which mates with the outer surface of said tube at said one end, said ring having a recess formed therein for snugly receiving the stem portion of said projection, thereby to prevent relative rotation between said tube and said ring; said method comprising the steps of punching said T-shaped projections into said tube by inserting an expandable punch axially into said tube, surrounding said free end portion of the



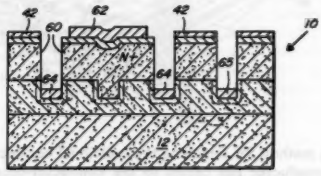
tube with an annular collar having at least one recess therein complementary to the stem portion of the projection; expanding said punch to stamp said projection in the tube removing said tube from said punch and collar and sliding said ring over said tube, with the recesses in the ring receiving the stem of said projection, and seating said ring in engagement with the cross bar of said projection.

3,938,241

VERTICAL CHANNEL JUNCTION FIELD-EFFECT TRANSISTORS AND METHOD OF MANUFACTURE

William Lloyd George; Robert Guy Hays, and Chongkook John Rhee, all of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 301,575, Oct. 24, 1972. This application June 24, 1974, Ser. No. 482,528
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **12 Claims**



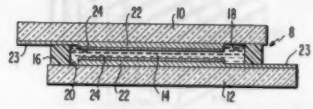
1. A method of field-effect device comprising:
providing a first layer of semiconductor material of a first conductivity type having a selected crystallographic orientation with respect to a first surface thereof;
selectively etching said first surface of said semiconductor material with an anisotropic etchant to remove some of said semiconductor material virtually only in a direction perpendicular to said first surface to thereby provide a plurality of juxta-positioned grooves having U-shaped cross sections in said semiconductor material, each of said grooves having an exposed bottom surface and exposed side surfaces;
diffusing an impurity of the second conductivity type into said bottom and side surfaces of each of said grooves a predetermined distance to provide a plurality of integral juxta-positioned gate portions of the second conductivity type having bottom and side surfaces, the resulting region of said semiconductor material between said side surfaces of adjacent ones of said gate portions providing a channel;
growing a second layer of semiconductor material of the first conductivity type in said grooves and on said first surface of said first layer of semiconductor material, said second layer being integral with said channel; and
depositing and patterning conductive material to provide separate electrical connections to said gate and to portions of said first and second semiconductor materials to form gate, drain and source contact areas.

3,938,242

FABRICATION OF LIQUID CRYSTAL DEVICES

Alan Sussman, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 27, 1973, Ser. No. 401,234
Int. Cl.² C23C *13/02*
U.S. Cl. 29—576 R **4 Claims**



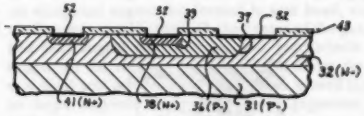
1. A method of fabricating a liquid crystal cell comprising:
vacuum depositing a layer of unoxidized metal on a surface of said cell in such manner to provide an oriented structure thereon along which the molecules of a liquid crystal material sympathetically align and,
heating said metal layer in the presence of oxygen to convert said metal to a layer of metal oxide retaining said oriented structure and which is more transparent than said metal layer.

3,938,243

SCHOTTKY BARRIER DIODE SEMICONDUCTOR STRUCTURE AND METHOD

Warren C. Rosvold, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 334,022, Feb. 20, 1973, Pat. No. 3,855,612, which is a continuation-in-part of Ser. No. 214,590, Jan. 3, 1972, abandoned. This application May 17, 1974, Ser. No. 470,939
Int. Cl.² B01J *17/00*
U.S. Cl. 29—578 **6 Claims**



1. In a method for fabricating a Schottky barrier diode semiconductor structure, providing a semiconductor body formed essentially of silicon having a surface, forming an active semiconductor device in said semiconductor body having collector, base and emitter regions extending to said surface, forming an insulative coating on said surface with openings exposing portions of said regions, one of said openings extending from the base region to the collector region, forming a ternary alloy of approximately 50% silicon, 37½% to 45% nickel and 5% to 12½% platinum in said openings in ohmic contact with the emitter, base and collector regions and in rectifying contact with the collector region in said one opening, whereby a Schottky barrier diode is formed in said one opening, and adjusting the relative amounts of nickel and platinum in said alloy to provide a predetermined barrier height in the range of approximately 0.64 to 0.835 electron volts.

3,938,244

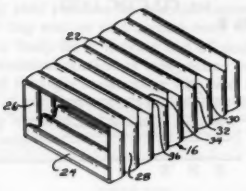
CONTINUOUS CORRUGATED WAVEGUIDE AND METHOD OF PRODUCING THE SAME

Michel Merle, Elmira, N.Y., assignor to Andrew Corporation, Orland Park, Ill.

Continuation-in-part of Ser. No. 315,101, Dec. 14, 1972, abandoned, which is a continuation of Ser. Nos. 235,161, March 16, 1972, abandoned, and Ser. No. 238,458, March 27, 1972, abandoned. This application Sept. 17, 1973, Ser. No. 397,955

Int. Cl.² H01P 11/00, 3/20; B21D 15/04

U.S. Cl. 29—600 20 Claims



1. A method of producing continuous lengths of coilable corrugated waveguide of a rectangular cross-sectional shape having intersecting walls, said method comprising the steps of forming a smooth-wall tube of electrically conductive metal with approximately the desired cross-sectional shape and with a substantially uniform wall thickness along the entire length and around the entire periphery thereof, and transversely corrugating the intersecting walls of said tube along crest and root lines that form a substantially constant perimeter length around any cross-section of the corrugated tube taken perpendicular to the axis of the tube at any point along the length of the tube, the depth of the corrugations being substantially smaller than the internal dimensions of the tube and substantially equal on all sides of the tube.

3,938,245

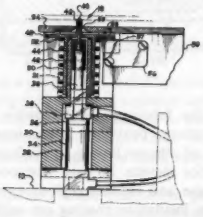
TERMINAL APPLICATOR

Charles Michael Lovendusky, Enola, and Charles William Wallick, York, both of Pa., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed July 23, 1974, Ser. No. 491,045

Int. Cl.² H05K 13/04

U.S. Cl. 29—626 19 Claims



6. An apparatus for applying a terminal into a hole in a circuit board, comprising:

a frame,

an anvil mounted on said frame for receiving a circuit board, said anvil including a retractable pin for locating a hole in a circuit board and an actuator member adjacent said pin for engagement by the circuit board when the circuit board is located on said pin,

means mounted on said frame for inserting a terminal into a hole in a circuit board in axial alignment with said pin,

means for extending said means for inserting the terminal in the hole in the circuit board toward said anvil,

means for retracting said pin, and

control means actuatable by moving the circuit board against said actuator member adjacent said pin for retracting said pin from the hole in said circuit board more rapidly than extending said means for inserting said terminal and positioning a terminal into the hole in the circuit board.

18. A method for positioning a hole in a circuit board for receiving a terminal, comprising the steps of

positioning the hole in the circuit board over a locating pin,

depressing the circuit board against an actuator member adjacent the locating pin,

retracting the locating pin from the hole in the circuit board to vacate the hole,

inserting a terminal into the vacated hole in the circuit board.

3,938,246

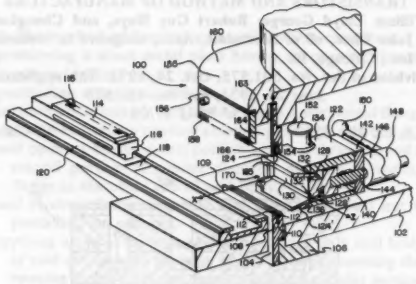
METHOD AND APPARATUS FOR ATTACHING MULTI-ONDUCTOR FLAT CABLE TO AN ELECTRICAL CONNECTOR

William Roderick Over, Harrisburg, and Paul William Gress, Newmanstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 6, 1975, Ser. No. 547,524

Int. Cl.² H01R 43/04

U.S. Cl. 29—628 8 Claims



8. A method for attaching the individual conductors in two multi-conductor flat cables to the conductor-receiving portions of a multi-contact connector, said conductor-receiving portions consisting of slots in contact terminals which are aligned in first and second oppositely facing rows, said method comprising the steps of:

punching holes between the conductors in two flat cables at a location adjacent to one end of said cables so that a portion of the insulation is removed,

positioning said connector in a movable connector holding means,

aligning said conductors in each of said flat cables with said slots in said first and second oppositely facing rows,

aligning stuffer pins with said conductors and with said corresponding slots, said stuffer pins being held by a continuous carrier strip,

locating cutting edges on each side of said connector between said cables and said strips, said cutting edges being parallel to said conductors and positioned to one side of each of said cables with said continuous strip extending across said cutting edges,

moving a ram containing movable insertion means towards fixed insertion means, said cables, said stuffer pins and said connector being located therebetween, so that said movable insertion means exerts a force on said first row adjacent to said movable insertion means which moves

said connector so that said second row abuts said fixed insertion means,

exerting an additional force on said movable insertion means so that each insertion means moves past the adjacent cutting edge severing said continuous strips and then forcing said conductors and stuffer pins into the aligned slots, whereby

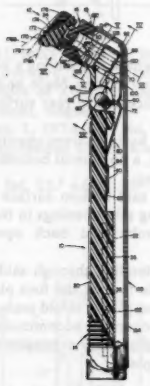
electrical contact is established between said slots and said conductors and said stuffer pins insure continued contact therebetween.

3,938,247

SHAVING SYSTEM WITH PIVOTAL HEAD

Nelson P. Carbonell, Lawrence, and Roger L. Perry, Lynnfield Center, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Mar. 5, 1974, Ser. No. 448,243
Int. Cl.² B26B *21/22*
U.S. Cl. 30—47 **20 Claims**



1. A shaving implement comprising a grip portion,

a transversely extending support portion at one end of said grip portion, said support portion defining a blade edge position, a connection between said grip portion and said support portion mounting said support portion for angular rotational movement relative to said grip portion during the course of a shaving stroke in a dynamic mode of shaving action about an axis extending transversely of said support portion parallel to and adjacent to said blade edge position, said connection including structure in said transversely extending support portion defining said axis at a point spaced further from said grip portion than portions of said transversely extending support portion,

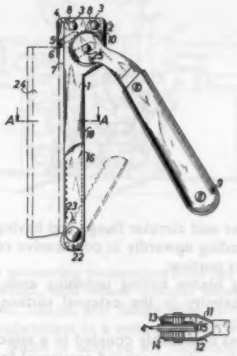
and structure for restricting the movement of said support portion relative to said grip portion, said movement restricting structure including a control portion movable between a first position which affords significant restriction of angular rotational movement and a second position which affords less restriction of angular rotational movement.

3,938,248

STRIPPING TOOL FOR A CABLE HAVING COVER MADE OF A SYNTHETIC MATERIAL

Josef Krampe, Werner Strasse 4, 4711 Herbern, Germany

Filed Aug. 29, 1974, Ser. No. 501,758
Claims priority, application Germany, Sept. 12, 1973, 2345938
Int. Cl.² B21F *13/00*; B26B *27/00*
U.S. Cl. 30—90.4 **7 Claims**



1. In a stripping tool for cutting the covering of a cable covered with a layer of synthetic material comprising two articulated parts one of which includes a stationary knife and the other which is a handle having at one end a gear wheel non-rotatably fixed thereon and divided in half and with the halves disposed on each side of the handle, the other part being mounted to the one part so that the gear wheels can be rotated by the handle to effect relative motion between the cable and the knife, the knife being introduced between the interior of the cable and the cable covering and including a guide shoe which guides the knife as it cuts into the cable covering, the improvement comprising:

a. the one part made in the form of an elongated rail to one side of which the cable can be applied, said rail having an enlarged head at one end;

b. said knife and shoe arrangement projecting from said one side of said elongated rail at said head;

c. an elongated angled slot formed in said head; and

d. shaft means passing through the center of the gear halves and said angled slot whereby said gear wheels will be supported for rotation by said handle about the axis of said shaft and wherein said axis can be moved linearly at an angle opposite the point of an engagement of said knife.

3,938,249

SPRINKLER HEAD CLEANING DEVICE

Rene Aragon Chacon, 20225 Sherman Way, Canoga Park, Calif. 91306

Filed Nov. 25, 1974, Ser. No. 526,606
Int. Cl.² B26B *27/00*
U.S. Cl. 30—300 **5 Claims**

1. In combination with a water sprinkler head having a circular flange supported on a water supply pipe, a cleaning device comprising:

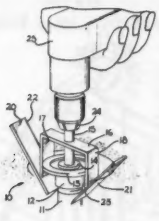
a shaft;

a U-shaped member secured to said shaft mid-way between the opposite ends of said shaft and having a pair of parallel legs downwardly depending from the opposite ends of a cross bar and said legs terminating below the underside of said flange;

a pair of cutting blades secured to the respective terminating ends of said U-shaped member legs in an angularly upwardly diverging direction;

stabilizing means for supporting and aligning said cutting blades with respect to said flange whereby said blades travel in a circular path above and beneath said flange;

each of said cutting blades having a lower portion extending angularly downward with respect to said water supply



pipe under said circular flange and having an upper portion extending upwardly in coextensive relationship with said lower portion;

said cutting blades having opposing ends terminating in close proximity to the external surface of said water supply pipe; and

power means detachably coupled to a selected end of said shaft for imparting powered rotational force thereto.

3,938,250

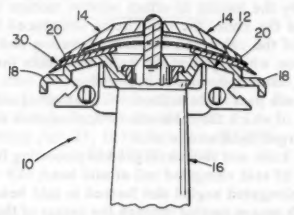
DISPOSABLE BLADE UNIT

Roger L. Perry, Lynnfield Center, Mass., assignor to The Gillette Company, Boston, Mass.

Filed May 15, 1974, Ser. No. 470,224

Int. Cl.² B26B *21/22*

U.S. Cl. 30—346.57 **2 Claims**



1. A disposable blade unit for a safety razor comprising a thin, transversely flexible base blade which is apertured along its longitudinal center line and has two parallel, longitudinal edges that are sharpened to cutting edges, the overall width of the blade between its cutting edges being from 0.8 to 1.0 inch,

a pair of supplemental blades, each said supplemental blade having a planar body portion permanently secured in contact with a planar portion of said base blade, each supplemental blade having a length substantially equal to that of said base blade and a width less than half that of said base blade, each said supplemental blade having a longitudinal edge that is sharpened to a cutting edge positioned parallel to and offset from the adjacent longitudinal edge of said base blade, the edge of each said supplemental blade and the adjacent edge of said base blade defining a set of tandem blade edges, the cutting edges of each said set being spaced apart a distance in the range of 0.03 to 0.08 inch, and

lower surfaces of said blade unit defining planar support surfaces, one planar support surface being associated with each set of tandem blade edges, one sharpened edge of each set of tandem blade edges being disposed below its associated planar support surface and the other sharpened edge of each set of tandem blade edges being disposed above its associated planar support surface, the blade tangent angle of each said other edge being in the range of 22°–28°, and the bisector of the angle between the facet surfaces that defines each sharpened edge being disposed at a downwardly inclined angle of at least 1° to its associated planar support surface.

3,938,251

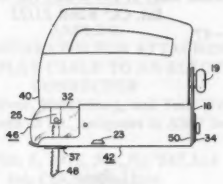
SABER OR JIG SAW WITH DEMOUNTABLE FOOT PLATE AND SHIELD

James Kareman, Bradley Beach, N.J., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Mar. 10, 1975, Ser. No. 556,829

Int. Cl.² B27B *11/02, 19/09*

U.S. Cl. 30—376 **4 Claims**



1. In combination with a saw having a vertically reciprocating vertically elongated cutting blade and a housing with an exposed bottom surface and a rear surface with a threaded hole:

a hollow foot plate having a front opening, spaced openings in its top surface, a horizontal bottom surface and a back having an opening;

bracket means on said bottom surface of the housing detachably engaging said openings in the top surface of the foot plate whereby said back opening overlies said threaded hole;

a threaded key extending through said back opening into the threaded hole to lock the foot plate in place; and

a hollow transparent plastic shield sealed except for aligned top and bottom openings accommodating said blade and a rear opening detachably engagable with the front opening of said foot plate.

3,938,252

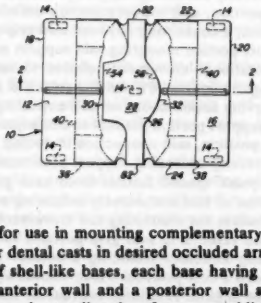
RELATOR FOR DENTAL CASTS

Julio R. Polanco, 1 E. Harriet Ave., Palisades Park, N.J. 07650

Filed Aug. 9, 1974, Ser. No. 496,175

Int. Cl.² A61C *11/00*

U.S. Cl. 32—32 **12 Claims**



1. A relator for use in mounting complementary maxillary and mandibular dental casts in desired occluded arrangement within a pair of shell-like bases, each base having a bottom, side walls, an anterior wall and a posterior wall all integral with the bottom and extending therefrom to establish a cavity, said posterior wall having an external planar surface, an oppo-

site internal surface and a peripheral edge surface between said external and internal surfaces, the peripheral edge surfaces each having a predetermined profile configuration, said relator comprising:

a base plate;

a planar surface on the base plate, said planar surface extending longitudinally between opposite ends and laterally between opposite sides;

locator means on the base plate raised from the planar surface, said locator means including a first altitudinal edge adjacent one of said opposite ends and a second altitudinal edge adjacent the other of said opposite ends;

the first altitudinal edge having a profile configuration at least portions of which are complementary to the predetermined profile configuration of the peripheral edge surface of one of the bases;

the second altitudinal edge having a profile configuration at least portions of which are complementary to the predetermined profile configuration of the peripheral edge surface of the other of the bases; and

said altitudinal edges being spaced apart from one another longitudinally a distance corresponding to the location of the shell-like bases when the peripheral edge surfaces of the bases are engaged with the corresponding altitudinal edges of the locator means and the dental casts are in said desired occluded arrangement.

3,938,253

DENTAL INSTRUMENT HOLDER

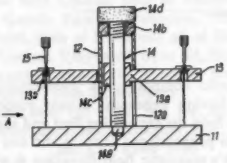
John David William Barnard, East Grinstead, and Peter Frank Kurer, Cheadle, both of England, assignors to Kurer Research & Development, England

Filed Oct. 1, 1974, Ser. No. 511,068

Claims priority, application United Kingdom, Oct. 9, 1973, 47071/73

Int. Cl.² A61C 3/00

U.S. Cl. 32—40 R **3 Claims**



1. A dental instrument holder for determining the working length for dental root canal instruments comprising

1. a base plate having a flat upper surface forming a datum plane,

2. a post extending upwardly from the base plate,

3. a holding plate having a flat upper surface, the holding plate having an aperture in which the post is received in a manner maintaining the flat upper surface of the holding plate parallel to the datum plane, the flat upper surface of the holding plate having a plurality of spaced parallel apertures extending through the holding plate in which dental root canal instruments can be received, the working length of the instruments being determined by the distance between the datum plane and the flat upper surface of the holding plate,

4. resilient means disposed around the post and acting between the base plate and the holding plate to resiliently support the holding plate for sliding movement on the post, and

5. means for locking the holding plate to the post at a selected level relative to the datum plane.

3,938,254

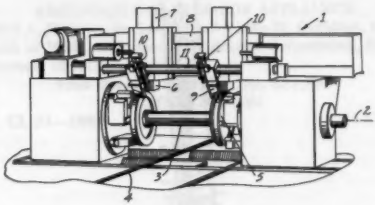
GAGING ASSEMBLY FOR AUTOMATICALLY CONTROLLED WHEEL LATHES

William R. Miller, Jr., Rochester, N.Y., assignor to USM Corporation, Boston, Mass.

Filed Aug. 30, 1974, Ser. No. 502,217

Int. Cl.² B23B 5/28

U.S. Cl. 33—203.11 **11 Claims**



1. A gage for measuring parameters from the contour of a worn railroad wheel, said wheel contour being defined by tread edge, tread, flange, and flange edge portions and for supplying said parameters to a system for automatically controlling a lathe which is adapted for reclaiming said wheel contour comprising:

A. a support block having means for mounting said block on the lathe at a predetermined radial distance from the turning axis of the lathe, for radial movement toward the wheel contour;

B. first and second contacting members mounted on the support block for movement thereon and also mutually interconnected to allow for limited relative movement between said contacting members, said members being situated on the support to sequentially engage the wheel tread and flange surfaces as the support block moves radially toward the wheel contour, the relative movement between said contacting members being indicative of the new diameter of the railroad wheel which is required to automatically adjust the lathe for the reclaiming operation; and

C. encoder means operatively connected to the support block and contacting member assembly to generate signals relative to the movement thereof and supply said signals to the automatic control system of the lathe.

3,938,255

CANTILEVER-TYPE INCLINOMETER

Henry P. Lichte, Jr., Houston, Tex., assignor to Geolograph Industries, Oklahoma City, Okla.

Filed Mar. 7, 1974, Ser. No. 449,228

Int. Cl.² G01C 9/12

U.S. Cl. 33—311 **1 Claim**

1. Apparatus for determining the inclination of a well bore comprising a flexible rod having an upper end and a lower end, means in said apparatus for rigidly supporting said upper end of said rod, a target means, means for vertically moving said target means needle point means operatively connected with said lower end of said rod and suspended over said vertically movable target means, means responsive to a predetermined condition for moving said target means relatively towards and against said needle point means, an elongated threaded cylinder mounted on said flexible rod above said needle point means, weight means having a threaded opening therein engaging the threads on said elongated threaded cylinder whereby said weight means can be rotated on said elongated threaded cylinder to move said weight means upwardly or downwardly, said weight means causing bending of said rod by cantilever action when said apparatus is in said well bore

and said well bore is inclined with respect to the vertical, and a lock nut means mounted on said elongated threaded cylinder for locking against said weight means to hold said weight means in fixed vertical position on said elongated cylinder.

3,938,256

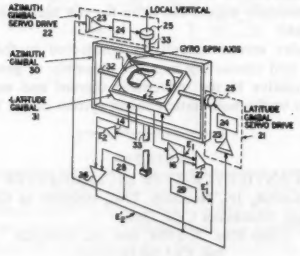
QUICK SETTLING GYROCOMPASS HAVING INTERAXIS DECOUPLING COMPENSATION FOR IMPROVED RESPONSE TIME

Earle B. Crocker, Jr., Pittsfield, Mass., assignor to General Electric Company

Continuation-in-part of Ser. No. 73,163, Sept. 17, 1970, which is a continuation-in-part of Ser. No. 701,690, Jan. 30, 1968, abandoned. This application Feb. 16, 1972, Ser. No. 226,751

Int. Cl. G01c *19/38*

U.S. Cl. 33—324 9 Claims



1. A quick settling, accurate gyrocompass comprising a packaged gyroscope having a case and rotor, said rotor having a spin axis and two orthogonal input axes about which motion takes place in aligning the spin axis, said gyroscope also including error signal generators (12, 13) and torquing generators (15, 17) for sensing and causing angular motion of the rotor about each input axis with respect to the spin reference axis of the case; external plural axis gimbal supporting means (30, 31) for supporting the packaged gyroscope with rotational freedom of movement about two said axes (32, 33); gimbal servo drive means (21, 22) for moving the packaged gyroscope about each said gimbal axis (32, 33); a torquing amplifier (14, 16) operatively coupled between the error signal generator and the torquing generator for motion about each input axis of said gyroscope for amplifying the error signals and for transmitting those signals to the torquing generator (15, 17) to drive the gyroscope rotor about said input axes to maintain alignment of the rotor and the gyroscope case to null any error signal due to a difference in alignment between the rotor spin axis and the spin reference axis of the case; a signal summing means (26, 27) coupled to the output of each torquing amplifier (14, 16); said gimbal servo drive means (21, 22) including motors (25) for driving said gimbal means and circuit means coupled to the output of each summing means (26, 27) for deriving signals of suitable polarity and magnitude for driving said motors to align the gyro spin axes with the earth's axis; and compensation circuit means (28, 29) connected between the output of each summing means (26, 27) and the input of the other summing means to cause said summing means to subtract from the torquing amplifier output a signal representing that component of the rate of rotation of the packaged gyro about its input axes which is due to gimbal rotation.

3,938,257

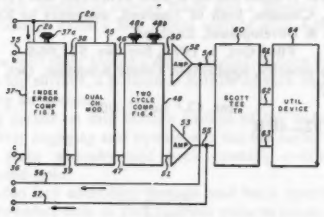
TWO-CYCLE COMPENSATOR FOR FLUX VALVE HEADING REPEATER SYSTEM

James R. Erspamer, Phoenix, Ark., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 2, 1974, Ser. No. 528,758

Int. Cl.[2] G01C *17/28*

U.S. Cl. 33—361 7 Claims



1. In a magnetic compass data transmission system for navigable craft having generator means responsive to the earth's magnetic field for generating first and second alternating output signals proportional to sin ψ and cos ψ representative of said earth's magnetic field direction ψ with respect to said craft and substantially independent of the magnitude thereof, said generator means inherently producing two-cycle data transmission errors in the presence of an element distorting the earth's magnetic field in the vicinity of said generator means, the combination for correcting two cycle data transmission errors comprising:

amplifier circuit means having first and second input means,

first summation means for coupling said signals proportional to sin ψ and cos ψ from said generator means to said first input means,

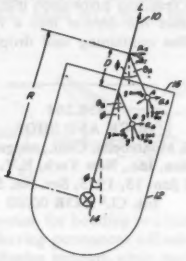
second summation means for coupling said signals proportional to sin ψ and cos ψ from said generator means to said second input means,

variable impedance means coupled in parallel relation with said second input means for controlling the magnitude of the effective gain γ of said amplifier circuit means in proportion to said two cycle data transmission error thereby supplying at the output of said amplifier circuit means in cooperation with said first and second summation means a signal representative of $(-\gamma (\sin\psi + \cos\psi)$, and third and fourth summation means responsive to said amplifier circuit means output for producing respective corrected data transmission signals proportional to sin $\psi + \gamma$ (sin $\psi + \gamma \cos\psi$), and to cos $\psi + \gamma$ (sin $\psi + \cos\psi$).

3,938,258
VERTICAL REFERENCE DEVICE

James K. Zook, Moorestown, N.J., assignor to AII Systems, Inc., Moorestown, N.J.

Filed Jan. 8, 1974, Ser. No. 431,640
Int. Cl.² G01C 9/08
U.S. Cl. 33—366 15 Claims

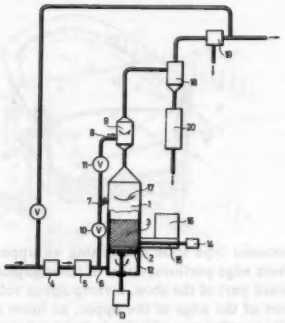


1. A vertical reference device comprising:
first and second pendulum means mounted on a body which is susceptible to angular motion about a horizontal axis, said first and second pendulum means being mounted at different vertical distances from said axis;
transducer means for generating signals proportional to the angular positions of said first and second pendulum means;
means for combining said signals and multiplying the same by a predetermined factor whereby said device can generate a signal proportional to the actual angular position of said body about said axis.

3,938,259
PROCESS FOR CONTINUOUS DRYING OF CHEMICAL PRODUCTS BY MILLING-FLUIDISATION

Zoltán Ormós; Béla Csukás, both of Veszprem; Béla Stefkó, Budapest; Karoly Pataki, Veszprem; Tibor Blickle, and József Felméri, both of Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest and Magyar Tudomanyos Akademia Muszaki Kemiai Kutato Intezete, Veszprem, both of, Hungary

Filed Dec. 16, 1974, Ser. No. 533,087
Claims priority, application Hungary, Dec. 22, 1973, RI 532
Int. Cl.² F26B 3/08
U.S. Cl. 34—10 6 Claims

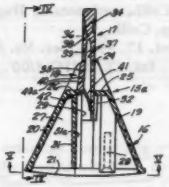


1. A process for continuously drying chemical products by milling fluidization, comprising introducing a wet paste of the chemical product to be dried into a fluidized layer of particles of an inert carrier, introducing gas into the fluidized layer to agitate the fluidized layer so as uniformly to distribute said paste on the surface of the particles of the inert carrier, maintaining the flow of gas into said fluidized layer at a rate insufficient to remove said carrier particles from the fluidized layer but sufficient to separate dried particles of said chemical product from the particles of the inert carrier and to remove said dried particles of said product from said layer, and removing said particles of dried product from gas that has left said layer.

3,938,260
ADJUSTABLE BAFFLE FOR APPLIANCE

Robert A. Brenner, St. Joseph, and Victor W. Cuthbert, Sodus, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 11, 1974, Ser. No. 531,789
Int. Cl.² F26B 9/04
U.S. Cl. 34—108 11 Claims

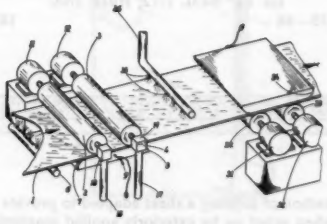


1. A clothes dryer having a drum rotatable about an axis for tumbling clothes being dried and an adjustable baffle, said adjustable baffle comprising:
a body portion attached to an interior wall of the drum parallel to said axis;
a blade portion in said body portion and slidably movable with respect thereto; and
resiliently biased detent means selectively releasable between said blade portion and said body portion and operative to lock said blade portion in either extended or retracted positions,
whereby tumbling characteristics of clothes within the drum are affected by the position of the blade with respect to the body portion of the baffle.

3,938,261
APPARATUS FOR IMPROVING PRINTING SURFACE OF PRINTING MATERIAL

James K. Anderson, 1110 Rostrevor Circle, Louisville, Ky. 40205

Continuation-in-part of Ser. No. 312,561, Dec. 6, 1972, Pat. No. 3,826,016. This application Feb. 27, 1974, Ser. No. 446,307
Int. Cl.² F26B 11/02
U.S. Cl. 34—114 12 Claims



1. An apparatus for improving the surface of a continuously moving web of printing material in combination with a printing press, said apparatus being disposed at the feed end of said printing press and comprising: a first treating zone including:

(1) at least one rotatably mounted pressure roller, (2) a first treating surface having a heat means as an integral part thereof and (3) a heating and moistening means prefacing said roller and treating surface, said rotatably mounted roller being disposed to contact said treating surface, said roller and treating surface being adapted to receive a web of material in contacting relationship therebetween under a preselected pressure with said surface of said web to be treated contacting said treating surface means rotating said roller at a surface speed at least equal to said surface speed of said web material and at a positive speed relative to said treating surface and exerting a preselected pressure upon said web of material thereby dragging said material under pressure across said treating surface.

3,938,262

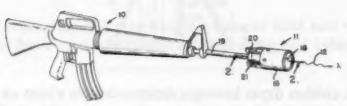
LASER WEAPON SIMULATOR

Richard A. Dye, Santa Barbara, and Donald A. Rowley, Goleta, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 17, 1974, Ser. No. 515,809

Int. Cl.² F41G *3/06*

U.S. Cl. 35—25 **4 Claims**



1. A laser weapon simulation comprising:

piezoelectric means providing the sole source of electrical power and control signals to a laser transmitter in response to the mechanical force generated by the firing pin of a weapon, said piezoelectric means being disposed in the breach of a weapon;

laser transmitter means coupled to said piezoelectric means, said laser transmitter means providing an output signal in response to said power and control signals and being coaxially aligned with the barrel of a weapon; and

circuit means coupling said piezoelectric means and said laser transmitter means.

3,938,263

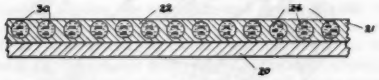
COMPARTMENTALIZED MICROMAGNET DISPLAY DEVICE

Clarence R. Tate, Fairfield, Ill., assignor to Thalatta, Inc., Fairfield, Ill.

Continuation-in-part of Ser. No. 756,711, Aug. 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 553,086, May 26, 1966, abandoned. This application Mar. 27, 1970, Ser. No. 23,424

Int. Cl.² B43L *1/12*; H01F *3/00*

U.S. Cl. 35—66 **10 Claims**



1. A method of forming a sheet adapted to provide a visual display when acted on by exteriorly applied magnetic forces comprising

a. providing micromagnets of a size range from about 25μ to about 1000μ, said micromagnets having a constant magnetization vector and surface color zones of contrasting colors;

b. suspending said micromagnets in a transparent carrier liquid of a density and viscosity sufficient to hold the said micromagnets in suspension at least a period of minutes;

c. suspending droplets of said carrier liquid containing said micromagnets in a liquid organic film-former, the density of the film-former liquid being about equal to or slightly less than that of said carrier liquid so that said droplets do not rise out of the film-former liquid;

d. forming the resulting suspension into a thin layer; and

e. hardening said film-former into a transparent organic polymeric film containing said droplets as fluid inclusions.

3,938,264

SOCK AND SHOE

Julius W. Burrell, Montebello, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 15, 1975, Ser. No. 541,231

Int. Cl.² A43B *00/00*

U.S. Cl. 36—1 **3 Claims**

1. A shoe fitted with a section of Velcro material in the inside forward toe section of the shoe for the purpose of engaging the forward section of the sock of a wearer of the shoe, said Velcro material being fixed to a forward toe section of the shoe that is inclined generally perpendicular to the plane of the sole of the said shoe.

3,938,265

MOCASSIN-TYPE SHOE

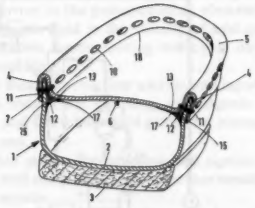
Robert Pröbstl, Walheim; Robert Reiter, Schrozberg, and Karl Vogelmann, Besigheim, all of Germany, assignors to Messrs. Sioux Schuhfabriken Peter Sapper, Walheim, Germany

Filed Mar. 12, 1975, Ser. No. 557,767

Claims priority, application Germany, Mar. 14, 1974, 2412206

Int. Cl.² A43B *3/14*

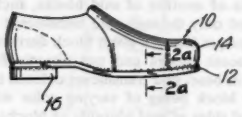
U.S. Cl. 36—11 **8 Claims**



1. A mocassin type shoe comprising an upper having upwardly turned edge portions, a row of holes adjacent said edge in the forward part of the shoe, a vamp apron rolled over said forward part of the edge of the upper, an inner and an outer substantially parallel row of holes in the border region of said vamp apron, a sealing strip of resilient compressible material inserted between the inner row of holes of the vamp apron and the row of holes on the upper, and a stitching seam passing through the resilient strip and through the holes of the upper and the holes of the inner and outer rows of the vamp apron,

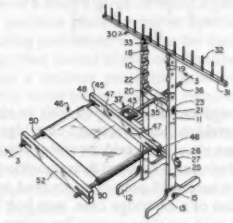
and compressing the strip between the vamp apron and the upper.

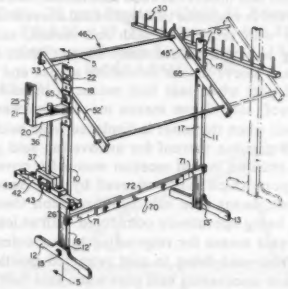
3,938,266
ADHESIVE SYSTEM
Melvin S. Cook, Saddle River, N.J., assignor to Holobeam, Inc., Paramus, N.J.
Filed Dec. 13, 1973, Ser. No. 424,274
Int. Cl.[2] A43B 9/12; B32B 00/00
U.S. Cl. 36—19.5 1 Claim



1. An adhesive system for bonding two items comprising an adhesive material having permanent adhesive characteristics and which loses adhesive strength when heated, electro-magnetic energy absorbing elements in the form of metal particles imbedded in said material, capsules for enveloping said elements and an adhesive weakening solvent disposed within said capsules with said elements, said energy enabling weakening of said adhesive characteristics to break said bond.

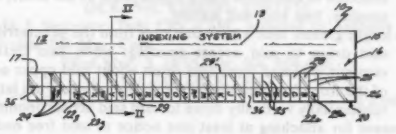
3,938,267
FANCY STITCHERY WORKING FRAME SUPPORT
Donald I. Bard, 7901 College Lane, Annandale, Va. 22003
Filed Sept. 3, 1974, Ser. No. 502,683
Int. Cl.[2] D06C 3/08
U.S. Cl. 38—102.1 12 Claims





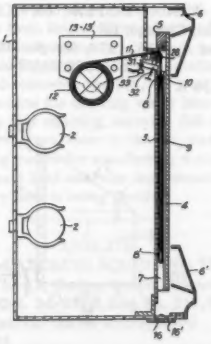
1. An apparatus for adjustably supporting a fancywork frame in a plurality of positions, comprising a pair of upright posts, a spacer member, means for mounting the spacer member at a selected height between said posts, rod means carried by said spacer member and extending transversely thereof and being longitudinally and rotatably adjustable relative thereto, support means connected to said rod means, and means for mounting the fancywork frame on said support means, whereby said posts may be disposed in side-by-side relationship and the fancywork frame selectively cantilevered from the spacer member and angularly adjusted relative to said posts.

3,938,268
INDEX SYSTEM
Harry C. Gilhula, 2802 Robinson Road, SE., Grand Rapids, Mich. 49506
Filed Jan. 31, 1974, Ser. No. 438,296
Int. Cl.[2] G09F 3/16; B42F 21/00
U.S. Cl. 40—23 A 7 Claims



1. An index tab assembly comprising:
a tab strip, initially free of adhesive, defining a plurality of tabs;
an adhesive transfer strip comprising a base strip made of a material from which adhesive is readily removeable and an adhesive film initially adhered to said base strip, said adhesive transfer strip being adhered to and extending from said tab strip spaced from an edge thereof for transferring a pressure-sensitive adhesive from said adhesive transfer strip to a portion of each tab of said tab strip as the tabs are removed from said adhesive transfer strip.

3,938,269
CASE FOR DISPLAYING NOTICES
Jean Catteau, 10, rue de Mora, Enghien-les-Bains (Val d'Oise), France
Continuation-in-part of Ser. No. 247,631, April 26, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 457,135
Claims priority, application France, Apr. 30, 1971, 71.15505
Int. Cl.[2] G09F 11/00
U.S. Cl. 40—30 5 Claims



1. A case for displaying notices, comprising, in combination:
a parallepipedal body of the type including bottom, rear, side and top wall parts and

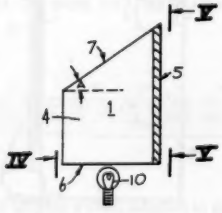
an at least translucent, non-removably mounted front face in
a substantially vertical, opaque frame, constituting
a front wall part; said wall parts being sealingly interconnected; said bottom wall part having therein
a single access opening substantially below said front wall part, including
a removable shutter and
means for sealing the latter in a substantially water- and dust-proof manner when closed; said body including in its upper inner space and behind
the upper edge of said front face
at least one rotatable drum in substantially parallel alignment with said upper edge of the front face and with said access opening;
at least one flexible element haivng
two ends, one by which said flexible element is removably attached to said drum along a generatrix of the latter, and another, free end, and having
a length greater than a path that runs from the generatrix of said drum to said access opening, when said flexible element is passed from said drum about said upper edge of the front face and thence along the inside of the latter, substantially vertically down toward said access opening;
means for attaching at least one notice to said free end of the flexible element so that the notice is suspended as an extension of and lengthwise beyond said flexible element;
said access opening having a width and a length that allow at least the notice and said attaching means to pass therethrough by gravity, upon rotation of said drum in a first direction;
drive means for selectively rotating said drum in the first direction, which corresponds to the unwinding of said flexible element attached thereto, with said free end moving downward along said inside of the front face and toward said access opening, and in a second direction which corresponds to winding up said flexible element onto said drum; and
means for arresting said drive means, on the one hand, when said attaching means have just passed beyond said bottom wall toward the outside through said access opening, the notice being then entirely on the outside; and,
on the other hand, when said attaching means have attained a height just below said upper edge of the front face, the notice being then fully exposed through said translucent front face, said arresting means also constituting
means for preventing the notice from ever reaching, and being rolled up even partly on, said drum.

3,938,270

VISUAL DISPLAY DEVICE

Danilo J. Santini, Chicago, Ill.

Filed Apr. 15, 1974, Ser. No. 460,671
Int. Cl.² G09F *13/18*
U.S. Cl. 40—130 K **1 Claim**



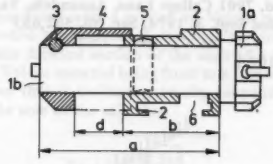
1. A visual display device, comprising
a plurality of blocks in next-adjacent side by side relation, each block being of substantially equilateral triangular cross-section and having two opaque sides of trapezoidal configuration, a third at least translucent, colored side of rectangular configuration, an at least translucent base of equilateral triangular configuration and an opaque top of isosceles triangular configuration, the base being substantially perpendicular to the three sides and the top triangle being at an angle of inclination with the base and having an angle at the corner joining the two sides of trapezoidal configuration and an opposite side coincident with the top edge of the third side and farther from the base than the angle; and
a plurality of light means each at the base of a corresponding one of the blocks, said blocks being arranged with said third side of at least one of said blocks adjacent a trapezoidal side of another of said blocks, such that light is transmitted only through said translucent third side, so that an opaque top of a given block derives colored light from adjacent blocks and not directly from the light means at its base, said translucent colored third side of at least one block being of varying color with respect to other third sides of said plurality of blocks.

3,938,271

EJECTION PORT CLOSURE FOR FIREARMS

Timo Hyytinen, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

Filed Mar. 29, 1974, Ser. No. 456,377
Claims priority, application Finland, Apr. 5, 1973, 1060/73
Int. Cl.² F41C *27/08, 11/00*
U.S. Cl. 42—16 **5 Claims**

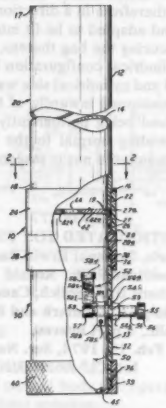


1. In a firearm, receiver means formed with an ejection port through which a cartridge case of a spent cartridge is ejected, elongated bolt means situated in said receiver means for longitudinal movement between a forward firing position and a rear retracted position where said port is uncovered to an extent sufficient for ejection of a cartridge case, said bolt means also being supported in said receiver means for rotary movement between locked and unlocked positions, sleeve means surrounding said bolt means and operatively connected thereto for rotating said bolt means between said locked and unlocked positions thereof in response to longitudinal movement of said sleeve means with respect to said bolt means, said sleeve means having a length substantially shorter than said bolt means and said sleeve means extending across and partially covering said port when said bolt means is in said forward position thereof, said sleeve means moving rearwardly with said bolt means when the latter is displaced from said firing to said retracted position thereof for uncovering said port, and cover means situated in said receiver means for covering that part of said port which is not covered by said sleeve means when said bolt means is in said firing position thereof, said cover means being operatively connected with at least one of the other of said means for responding to movement of said bolt means from said firing to said retracted position to assume a position uncovering said port when said bolt means is in said retracted position thereof, said sleeve means covering a front portion of said port and said cover means covering a rear portion of said port when said bolt means is in said firing position thereof, said cover means being fixed to a rear portion of said bolt means for rotary and longitudinal movement with said bolt means.

3,938,272
TOY CANNON

Donald R. Ditto, and Kenneth H. Hare, both of 3129 Maple Leaf Lane, Dallas, Tex. 75233

Filed Mar. 28, 1974, Ser. No. 455,854
Int. Cl.² F41F 1/00
U.S. Cl. 42—55 4 Claims

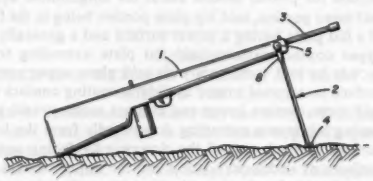


1. Apparatus to launch a resilient projectile comprising: a tubular barrel having a longitudinally extending bore open at one end; a combustion chamber adjacent an end of said bore, said combustion chamber having a volume approximately one-third the volume of the bore of the tubular barrel; said combustion chamber having an end cap removeably secured thereto to allow ventilation of the combustion chamber and the addition of a fresh charge of liquid hydro-carbon fuel upon removal; a partition plate having an aperture formed therein, said plate being positioned between the barrel and combustion chamber; ignition means in said combustion chamber to ignite the fuel; and a resilient projectile positionable in said bore, said projectile being larger than the diameter of said bore such that movement of said projectile through said bore towards said partition plate compresses a fuel-air mixture in said combustion chamber to increase the compression ratio of the fuel-air mixture, such that the position of the projectile relative to the partition plate determines the compression ratio of the fuel-air mixture.

3,938,273
FIREARM HAVING TWO PIVOTED PROPS

Paul E. Tellie, 20, rue Bergson, 42000 St. Etienne, France

Filed May 17, 1974, Ser. No. 470,857
Claims priority, application France, June 1, 1973, 73.19959
Int. Cl.² F41C 29/00
U.S. Cl. 42—94 9 Claims



1. A firearm of the type having two props having feet, said props being pivoted to its front portion about two respective laterally protruding trunnions, said props being adapted to occupy at least one active position in which, their feet resting on the ground, they serve as support for the front portion of the firearm so as to maintain it elevated, and an inactive position in which they are swung back along the firearm, each prop comprising:

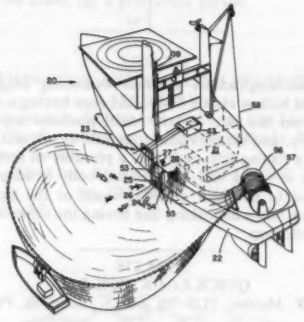
a prop rod, said prop rod having a foot, a head having a blind hole by means of which it can be engaged over the laterally protruding trunnion on the firearm, and said head having a radial extension, a bore in said radial extension, said bore slidably receiving the end of the prop rod which is opposite its foot,

means for axial retention of the head on the trunnion, and within the head, means for the automatic locking of said end on the trunnion in the two aforementioned positions, said means being unlockable under the effect of a pull exerted on the rod in the direction of its axis.

3,938,274
OCEANIC FISHING SYSTEM

David J. Seymour, Daly City, Calif., assignor to Anthony M. Ursich, Del Mar, Calif.

Filed Mar. 3, 1975, Ser. No. 554,445
Int. Cl.² A01K 73/12
U.S. Cl. 43—4.5 6 Claims



1. An oceanic fishing system, including in combination:

a ship having an opening through its hull below waterline on the port side,

a fish entry tank in said ship on the port side and connected to said opening by a conduit,

closure means for said opening so that it can be shut or open as desired,

compensating heel and trim tank means in said ship on the opposite side of said ship from said fish entry tank for offsetting the heel, list, and trim effects of entry of water into said hold compartment,

means inside said fish entry tank for separating the fish from the water and removing the fish,

first pumping means for drawing water into said fish entry tank through said opening, carrying fish therewith, and for returning the sea water to the sea, and

second pumping means for transferring water from the sea rapidly into said heel and trim tank means quickly while said fish entry tank is being flooded.

3,938,275
LURE FOR CATCHING SQUID AND THE LIKE

Juzo Fukushima, 12-13, Omiya, Sasebo, Nagasaki, Japan

Filed Oct. 24, 1974, Ser. No. 517,715
Int. Cl.² A01K 85/00, 83/00
U.S. Cl. 43—42.24 3 Claims

1. A lure for catching squid and the like comprising a hollow elastic body, said hollow elastic body being elongated and having holes on each longitudinal end, a hook device disposed at one end of said elastic body, said hook device including a longitudinally contiguous core and shank, one or more um-

brella-type hook elements disposed on said core, ring means disposed about said hook elements and said core to prevent the hook elements from sliding on said core, said shank passing through one of said holes at the longitudinal end of said hollow elastic body and extending into said hollow elastic body, said core being disposed outside said hollow elastic body adjacent to said one hole at the longitudinal end of said elastic body, said umbrella-type hook elements having first radial portions extending radially outwardly from said core

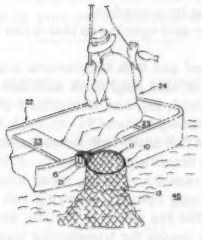
and second longitudinal portions extending longitudinally toward said hollow elastic body, said core having a connector extending on the side of said radial portions opposite said elastic body, and means connecting said shank and said connector to a fishing line such that a plurality of lures may be connected in series and each elastic body is adapted to be compressed to facilitate catching squid or the like on said hook device when the fishing line having the series-connected lures is pulled up.

3,938,276

QUICK-LOCK FISH BAG

Charles W. Mettler, 1120 7th Ave. S., South St. Paul, Minn. 55075

Filed Apr. 28, 1975, Ser. No. 572,408
Int. Cl.[3] A01K 97/04
U.S. Cl. 43—55 1 Claim



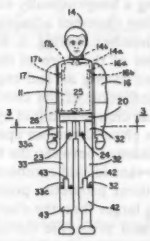
1. A fish bag intended for use with an oarlock hole of a fishing boat, the bag comprising, in combination:
a ring member of an elongated continuous endless band having a circular cross-sectional configuration;
a plurality of S-hooks suspended from the ring member and extending downwardly therefrom;
a net having its open mouth end suspended from the S-hooks completely about the ring the net being manufactured of woven wire having an open mouth end, a closed bottom end, and side wall surfaces, the open mouth end being suspended generally parallel to the plane of the ring and spaced slightly downwardly therefrom by the S-shaped hook;
a bracket affixed to the ring and extending radially outward therefrom, the bracket being of a winged V-shaped configuration having the wings permanently affixed to the ring and with the vertex of the V projecting radially outwardly from the ring, the bracket lying coplanar with the plane of the ring and having its vertex end extending furthest outwardly from the periphery of the ring; and
a cylindrical post affixed to the bracket and extending downwardly therefrom in a direction normal to the plane of the ring and adapted to be fit into the oarlock hole of a boat for securing the bag thereto, the post being of an elongated cylindrical configuration having a top end and a bottom end and cylindrical side walls, the top end of the post being positioned inwardly of the vertex portion of the bracket and being permanently affixed thereto with the post extending normal to the bracket in the same direction in which the net is suspended from the ring.

3,938,277

ARTICULATED TOY FIGURE

Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb and Erwin Benkoe, both of Northridge, Calif., a part interest

Filed Feb. 19, 1974, Ser. No. 443,774
Int. Cl.[3] A63H 3/20
U.S. Cl. 46—161 8 Claims

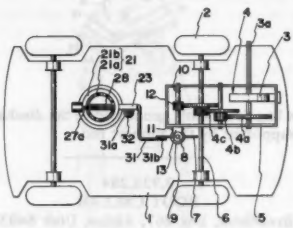


1. A toy figure comprising:
a three dimensional torso portion having a longitudinal axis extending generally vertically, said torso portion having an upper end and a lower end which defines a generally flat downwardly facing contact surface,
a head portion supported at said upper end of said torso portion,
a pair of arm portions pivotally attached to said torso portion,
a hip plate portion attached to said lower end of said torso portion for pivotal motion about the longitudinal axis of said torso portion, said hip plate portion being in the form of a flat plate having a power surface and a generally flat upper contact surface, said flat plate extending transversely to said torso axis with said plate upper contact surface juxtaposed to and in slidable mating contact with said torso portion lower end contact surface, said plate having tab means extending downwardly from the lower surface thereof, one of the downwardly facing contact surfaces of said torso portion and the upper contact surface of said plate having a locking recess therein and the other thereof having a locking knob extended into and locked within the recess to permit pivotal motion of the hip plate portion relative to the longitudinal axis of the torso portion, and
a pair of leg portions pivotally attached to said tab means.

3,938,278
STARTER DEVICE FOR TOYS

Yasuo Nakamori, Matsudo, Japan, assignor to Sanyo Onkyo Seiki Co. Ltd., Tokyo, Japan

Filed Dec. 20, 1974, Ser. No. 534,705
Claims priority, application Japan, Aug. 29, 1974, 49-103530
Int. Cl.² A63H 17/00
U.S. Cl. 46—202 6 Claims



1. A toy comprising:
a. a body;
b. a shaft mounted on said body;
c. a wheel mounted on said body and operatively connected to said shaft for joint rotation;
d. drive means mounted on said body and connected to said shaft for rotating the shaft;
e. a mounting member on said body defining a path for an auxiliary toy toward and away from a mounting position on said body;
f. an operating element movably secured to said mounting member;
g. biasing means yieldably biasing said element toward a position in which a portion of said element extends into said path for displacement of said element by said auxiliary toy during movement of said toy in said path toward said position; and
h. stop means movably mounted on said body and operatively interposed between said element and said shaft for stopping said shaft in response to displacement of said engagement portion.

3,938,279
GROWTH MEDIUM TO COVER THE SURFACE OF THE GROUND

Gunnar Johan Fonne, Porsgrunn, Norway, assignor to Norsk Hydro A. S., Oslo, Norway

Filed Feb. 8, 1974, Ser. No. 440,840
Int. Cl.² A01C 1/00; C04B 13/22
U.S. Cl. 47—9 3 Claims

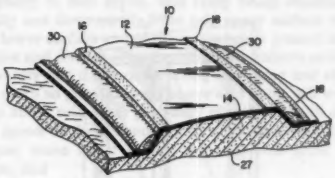
1. A growth medium for covering the surface of ground which comprises a mixture of Portland cement, an organic fibrous material and fertilizer in a weight ratio of 10–40:5–20:5–15.

3,938,280
MULCH AND METHODS OF MANUFACTURING AND UTILIZING THE SAME

Joseph S. Vandemark, Urbana, Ill., and Robert T. Seith, Tuscaloosa, Ala., assignors to Gulf States Paper Corporation, Tuscaloosa, Ala.

Division of Ser. No. 470,910, May 17, 1974. This application June 23, 1975, Ser. No. 589,354
Int. Cl.² A01G 7/00
U.S. Cl. 47—9 4 Claims

1. A method of providing a mulch, which comprises providing a supply of paper sheet covered substantially completely on one side thereof with a water-impervious material, feeding said sheet from said supply, laying said sheet upon the ground with said material against the ground as the sheet is fed from the supply, treating marginal regions only of the opposite side of said sheet adjacent to opposite longitudinal edges thereof

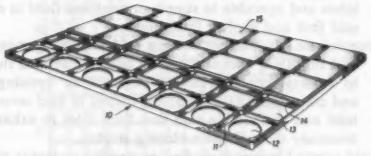


with a water-insoluble fungicide, and placing soil or the like substantially upon the treated regions only in order to hold down the sheet upon the ground, without substantial deterioration of the sheet, for a protracted period.

3,938,281
GERMINATION AND SEEDLING PROMOTING ASSEMBLY

Sven Ake Ingerstedt, Simrishamn, and Arne Nils Lantz, Asbro, both of Sweden, assignors to Hasselfors Bruks Aktiebolag, Hasselfors, Sweden

Filed Feb. 21, 1974, Ser. No. 444,308
Int. Cl.² A01C 11/00
U.S. Cl. 47—37 5 Claims



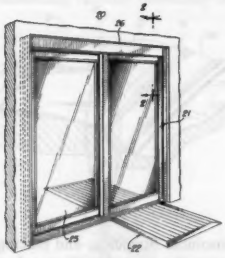
1. A germination and seedling promoting assembly comprising:
a. a plurality of individual moisture-absorbent bodies having a water content too low to initiate seed germination;
b. at least one ungerminated seed disposed in each of said bodies;
c. a support member having a plurality of shallow pockets respectively snugly receiving at least the lower portion of said bodies, the bottom of each said pocket being apertured to expose more than half but less than all of the under surface of its said body to atmosphere, said pockets being in proximity to the adjacent ones of said pockets;
d. a rectilinear support frame having four side portions of equal height, a pair of opposite ones of said portions being vertically offset from the other pair of said portions; and
e. means secured to certain of said portions for supporting said support member with said bodies thereon, out of contact with the surface that the lower of said pair is resting;
whereby another similar support frame may be supported on the upper side of said lower pair, and whereby said side portions of a plurality of stacked support frames jointly define a substantially closed box-like structure.

3,938,282

SLIDING DOOR OPERATOR

Raghbir C. Goyal, Niles, Mich., assignor to Kawneer Company, Inc., Niles, Mich.

Filed Feb. 1, 1974, Ser. No. 438,593
Int. Cl.² E05F 15/02
U.S. Cl. 49—137 8 Claims



1. An automatic door operator used in opening and closing a door which is mounted upon a door frame for sliding movement in a vertical plane between open and closed positions in response to movement of traffic adjacent the door, said door operator comprising:

a drive cylinder for mounting relative to said door frame having first and second fluid inlets;

a piston slideably movable within said drive cylinder through door opening and door closing strokes between said first and second fluid inlets;

a drive means for connecting said piston to a door to drive the door through the door opening and door closing strokes;

a means for supplying pressurized fluid from a suitable source thereof connected to said first and second fluid inlets and operable to supply pressurized fluid to either of said first and second fluid inlets;

control means interconnecting said supplying means with said first fluid inlet and connecting said second fluid inlet to exhaust continuously throughout an opening stroke and connecting said supplying means to said second fluid inlet and connecting said first fluid inlet to exhaust continuously throughout a closing stroke;

said control means including means for reducing the pressure of fluid acting on said piston from a side thereof in communication with one of said fluid inlets connected for supplying pressurized fluid to said cylinder after said piston has moved part way along on a stroke; and

exhaust metering means metering the exhaust flow of fluid at least as the door approaches the end of its stroke.

3,938,283

DUST BAG SUPPORT

James A. Keith, Jr., Pickens, S.C., assignor to The Singer Company, New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,467
Int. Cl.² B24B 23/00, 55/06
U.S. Cl. 51—170 R 4 Claims

1. A portable sanding tool having a motor driven oscillating platen carried by a housing, and means for discharging from the housing dust-laden air created by the use of the tool upon a work surface comprising:

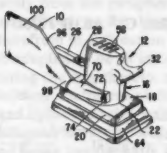
a. a discharge conduit rigidly connected to the housing,

b. at least one radial flange formed on the outer periphery of the discharge conduit,

c. notch means formed in the flange of the discharge conduit,

d. a support rod including an arcuate section defining an expandable throat, and a straight section,

e. the straight section of the support rod disposed in the notch means of the flange to permit the arcuate section of the support rod to encircle the discharge conduit adjacent the flange, and



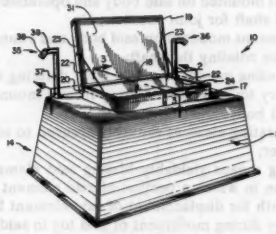
f. a dust bag detachably connected to the discharge conduit and supported by the support rod.

3,938,284

ROOT CELLAR

Lynn C. Broadbent, Box 267, Alpine, Utah 84033, and William B. Thomas, 8335 S. 10th East, Sandy, Utah 84070

Filed Oct. 29, 1974, Ser. No. 518,465
Int. Cl.³ E04H 7/22
U.S. Cl. 52—20 7 Claims



1. A pre-built, transportable root cellar comprising

a top wall having a layer of insulating material formed therein;

spaced apart front and rear walls interconnected by said top wall and extending downwardly therefrom;

spaced apart side walls interconnected by said top and front and rear walls whereby said walls form a shell having an open bottom;

an opening formed through the top wall large enough for a person to pass through;

a flange surrounding the opening and projecting upwardly from the top wall, said flange including a layer of insulation extending from an inner face of the top wall to the top of the flange;

a lid pivotally connected to the flange and adapted to be pivoted between an open position overlying the flange and closing the opening, said lid including a layer of insulating material arranged to fully overlie the flange when the lid is in the closed position; and

air vent means through the top wall.

3,938,285

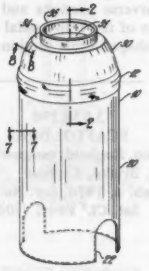
MANHOLE AND METHOD OF MANUFACTURE

Agnar Gilbu, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 322,344, Jan. 10, 1973, abandoned.
This application Jan. 6, 1975, Ser. No. 538,984
Int. Cl.² E02D 29/14
U.S. Cl. 52—20 9 Claims

1. A preformed manhole enclosure suitable for use underground and made of glass fiber reinforced plastic, the manhole

enclosure comprising a tubular body and a dome at an upper end of the tubular body, the dome including a wall of continuous double curvature and having a manway providing access to the interior of the tubular body, the dome further including a load bearing shoulder and an integral stiffening collar, the load bearing shoulder circumscribing the manway and presenting a generally planar, upwardly facing annular surface for supporting a load, the stiffening collar extending generally perpendicularly upwardly from an inner edge of the shoulder and being effective to stiffen the shoulder against deflection



due to externally applied loads, and a central vertical section through the dome being defined on each of opposite sides of the manway by a downwardly concave curved section of the wall extending upwardly from the tubular body and curving radially inwardly of the dome in a downwardly concave curve, a section of the load bearing shoulder extending radially inwardly of the dome from an upper end of the downwardly concave section of the wall, and a section of the stiffening collar extending upwardly from an inner end of the section of the load bearing shoulder.

3,938,286

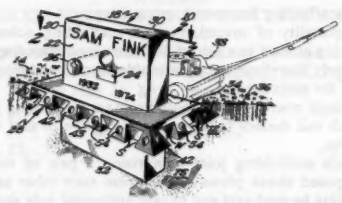
GRAVE MARKER

Frank N. Mochinski, 708 Adams St. NE., Minneapolis, Minn. 55413

Filed Dec. 18, 1974, Ser. No. 533,965

Int. Cl.² E04H *13/00*; E04F *19/02*

U.S. Cl. 52—103 **7 Claims**



1. An improved grave marker, resistant to tipping and usable on a cemetery lawn to permit easier trimming of grass adjacent the marker by a standard lawnmower having wheels at ground level, comprising:

an integral body including a generally upright member with a top and bottom and having a decorative exterior bearing identifying indicia;

said integral body further including a generally horizontal apron affixed to and extending about said upright member, extending outwardly therefrom, and positioned between said top and bottom of said member, said apron including upper and lower surfaces with said upper surface defining a substantially flat runway adjacent said upright member and positionable at substantially ground level to permit a wheel of the lawnmower to roll on said flat runway, thereby trimming grass adjacent said apron, said bottom of said upright member being positionable below ground level and cooperating with the outwardly extending apron to resist tipping of the marker;

said apron further including an earth-engaging ramp extending about said apron and positioned between said upper and lower surfaces of said apron and spaced outwardly from said upright member to define the outer periphery of said apron, said ramp being inclined outwardly and downwardly from said upper surface toward said lower surface and positionable below ground level to receive and direct roots of grass growing above said ramp outwardly and downwardly along said ramp and clear of said ramp so grass growing above said ramp will wrap its roots about said outer periphery of said apron to anchor said apron to the ground and to direct the roots toward deeper, more moist ground for improved grass sustenance; and

said outer periphery of said apron being crenellated to provide a plurality of alternating crenels and merlons permitting grass above said merlons to send roots through said crenels to further anchor said ramp to the ground and further improve grass sustenance.

3,938,287

MAUSOLEUM

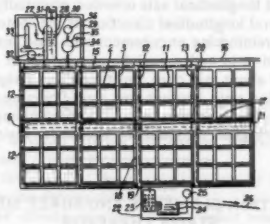
Fernand Gauchard, Parc du Beau, Santeny (Val de Marne), France

Filed Dec. 19, 1974, Ser. No. 534,449

Claims priority, application France, Dec. 28, 1973, 73.46933

Int. Cl.² E04H *13/00*

U.S. Cl. 52—134 **5 Claims**



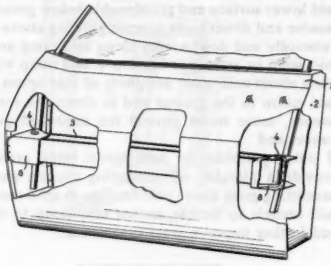
1. A mausoleum comprising a plurality of prefabricated concrete modules each comprising a plurality of vaults separated by horizontal bottom walls and vertical side walls, coffins in at least some of said vaults, vertical and horizontal tubes embedded in said vertical and horizontal walls, respectively, risers connected to the tubes embedded in the horizontal bottom walls and opening in each vault, coupling means connected between a said riser and a coffin in the corresponding vault, a valve in said coupling means allowing the passage of liquid from the coffin to within the riser and of gases in both directions but preventing overflowing of liquids from the riser into the coffin, said tubes in said horizontal walls being inclined upwardly toward and connecting with said vertical tubes at one end of said horizontal tubes thereby to prevent the flow of liquid from said horizontal tubes into said vertical tubes at said one end, and means for removing gas from the vertical tubes at said one end of said horizontal tubes, said horizontal tubes communicating with other said vertical tubes at the other ends of said horizontal tubes, and means for removing liquid from said other vertical tubes.

3,938,288

REINFORCING DEVICE FOR AUTOMOBILE BODY

Pierre Roubinet, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Mar. 5, 1974, Ser. No. 448,199
Claims priority, application France, Mar. 6, 1973, 73.07882
Int. Cl.² E04C 2/08
U.S. Cl. 52—615 8 Claims



1. A reinforced motor vehicle door for protecting a motor vehicle against lateral impact comprising:

spaced apart main door panels forming inner and outer walls of the motor vehicle door and secured to rigid door frame members;

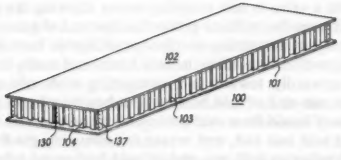
protecting means mounted on said frame members disposed between said main door panels for imparting lateral protection to the motor vehicle door, said protecting means including a structure comprising a rigid strip having inner and outer walls and which is in the form of a sleeve having an oval-like longitudinal cross-section and mounted on the motor vehicle door for pivotal movement therewith with said longitudinal axis oriented essentially parallel to the general longitudinal direction of the motor vehicle, a core in reinforcing engagement with said inner walls of said rigid strip and a peripheral winding of filamentary material about said core constituting said rigid strip and comprising resin impregnated glass fibers under tension, said peripheral winding being composed of approximately 50 to 80% glass yarn and the remainder resin.

3,938,289

CONSTRUCTION ELEMENTS AND SHEET METAL WEB STRIPS THEREFOR

Johan Caspar Falkenberg, Fjordveien 59C, N-1322 Hovik, Norway

Continuation-in-part of Ser. No. 327,924, Jan. 30, 1973, Pat. No. 3,872,641. This application Aug. 15, 1974, Ser. No. 497,828
Claims priority, application Norway, Jan. 31, 1972, 228/72; June 29, 1972, 2328/72
Int. Cl.² E04B 2/28
U.S. Cl. 52—618 12 Claims



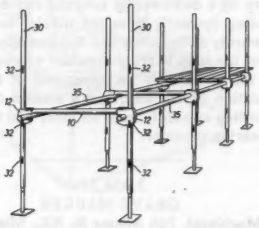
1. A construction element comprisng two parallel plates of nailable material and at least one web element disposed between and perpendicular to said plates for interconnecting said plates in spaced apart relationship, said web element comprisng an elongated metal sheet having substantially trapezoidal corrugations with parallel sharp bends extending throughout the width thereof, said sheet having a plurality of spaced teeth lying in the same plane as said sheet and extending outwardly of opposite side edges thereof and embedded in said respective plates, said teeth along one of said edges being in transverse alignment with the teeth along the other of said edges, said sharp bends of said sheet extending into said teeth, and each said teeth having at least two sharp reverse bends extending likewise through the width of said sheet and being located at the transverse sections and at a portion of the longitudinal sections of the trapezoidal corrugations thereby forming teeth of Z-shaped cross-section.

3,938,290

SCAFFOLDING

Cyril F. Wyatt, Devon, England, assignor to Tower Scaffolding (Bristol) Limited, Bristol, England

Filed Feb. 4, 1974, Ser. No. 439,686
Int. Cl.² F04G 1/06
U.S. Cl. 52—646 18 Claims



1. A scaffolding framework comprising:

a. a plurality of spaced, vertical scaffolding poles, each having at least one pair of diametric lugs extending transversely therefrom at opposite side thereof and intermediate the ends thereof,

b. at least one horizontal pole having a scaffolding joint at each end thereof for engaging respective of said vertical poles,

c. each scaffolding joint comprising a pair of vertically disposed cheek plates spaced from each other and projecting beyond said end of said horizontal pole and forming an open-sided vertical channel therebetween receiving an intermediate part of an adjoining vertical pole, the width of the opening in the side of the channel being sufficient for said vertical pole to pass laterally therethrough and each of said cheek plates having a downwardly open recess therein engaging one of said pair of lugs on the adjoining vertical pole,

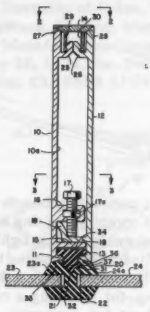
d. whereby said horizontal pole is supported against axial movement by the lugs and may be lowered and raised to cause said open recesses in said pair of cheek plates to engage and disengage respectively said pair of lugs and, when raised, may be moved horizontally towards and away from said vertical pole to cause the intermediate part of said vertical pole to pass through the opening in said vertical channel.

3,938,291

GLAZING PANEL SUPPORT SYSTEM

Homer C. Criswell, 2608 Black Oak Lane, Arlington, Tex. 76012

Filed Sept. 3, 1974, Ser. No. 502,766
Int. Cl.² E04C 3/30
U.S. Cl. 52—731 4 Claims



1. An interlocking mullion comprising

a. a first plate having an inner surface and an outer surface, a leg extending from one end of the inner surface for mating with a support groove in a gasket, first and second parallel bosses extending from said inner surface and spaced from said leg, and an end face receiving means extending from said inner surface near the end opposite said leg;

b. a second plate having an outer surface and an inner surface positioned adjacent and parallel with said first plate means, a leg extending from one end of the inner surface for mating with a support groove in a gasket, a lug extending from said inner surface and between said first and second bosses, and an end face receiving means extending from said inner surface near the end opposite said leg;

c. stud means threadedly mounted in said first boss and mating with said lug to secure said first and second plates in a fixed relationship; and

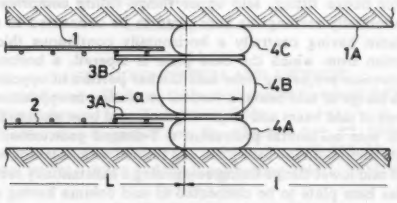
d. end face means mating with the ends of said first and second plates opposite said legs.

3,938,292

PROCESS FOR REINFORCED CONCRETE WALL FORMING

Takato Kawasaki, and Yuko Ikuta, both of Yokohama, Japan, assignors to Takenaka Komuten Company, Ltd., Japan

Filed June 29, 1971, Ser. No. 157,864
Claims priority, application Japan, July 2, 1970, 45-58168
Int. Cl.² E04G 21/02
U.S. Cl. 52—742 2 Claims



1. A process for the sequential segmental construction of a reinforced concrete unit comprising sequentially: (1) preparing a trench of dimensions at least equal to a selected portion of the total section to be constructed and having a length greater than an incremental segment to be constructed; (2) positioning a primary segment reinforcing cage in said trench; (3) positioning intersegmental perforate plate reinforcing partially overlapping said primary segment reinforcing cage; (4) positioning sealing means to define a segmental volume from which said plate reinforcing partially protrudes and effective to prevent concrete from flowing out of said segmental volume; and (5) pouring concrete into said segmental volume.

3,938,293

POLE REINFORCEMENT INSTALLATION

James E. Warjone, Seattle, Wash., and Albert C. Wilkison, New Westminster, Canada, assignors to Truckweld Equipment Company, Seattle, Wash.

Division of Ser. No. 249,249, May 1, 1972, Pat. No. 3,847,231.
This application June 28, 1974, Ser. No. 483,944
Int. Cl.² E02D 7/06
U.S. Cl. 52—742 4 Claims

1. The method of installing pole splints comprising the steps:

providing a splint driving mechanism movable between supply and driving locations,

engaging the splint at the supply location by securing the splint to the driving mechanism,

moving the driving mechanism with splint attached to the driving location,

unsecuring the splint from the driving means at the driving location, and

driving the splint into the ground with the driving mechanism.

3,938,294

METHOD OF ERECTING A FRAME STRUCTURE FOR BUILDINGS

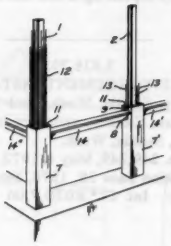
Leon Battista Gaburri, Piazza Partigiani, 29 - Alassio (Savona), Italy

Division of Ser. No. 84,325, Oct. 27, 1970, which is a continuation-in-part of Ser. No. 763,123, Sept. 27, 1968, abandoned. This application May 8, 1974, Ser. No. 467,994
Claims priority, application Italy, Mar. 30, 1968, 14667/68
Int. Cl.² E04B 1/00
U.S. Cl. 52—743 4 Claims

1. A method of erecting a frame structure for a building which frame structure is highly resistant to wind pressure and seismic shocks while being erected and when being completed, said method comprising the steps of:

first anchoring prefabricated studs in upright position and spaced apart in a foundation;

then fitting upon each stud a prefabricated one-piece tubular concrete casing member with an inner cross-sectional area larger than the outer cross-sectional area of the studs and having joining means including at least one receiving recess at the upper end of the casing member;



then filling the remaining space between each casing member and the stud therein with an initially flowable but hardening cementitious mass; and

then inserting into each of said recesses of the joining means an end of a cross beam of a length spanning two adjacent casing members to locate and support said cross beam in horizontal position.

3,938,295

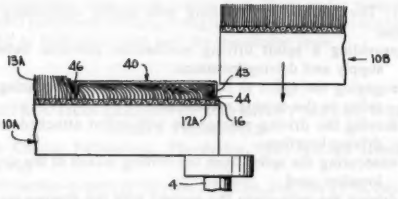
METHOD FOR ASSEMBLING AN ACCESS FLOOR SYSTEM

Donald L. Tate, 46 St. Andrews Road, Severna Park, Md. 21146

Continuation of Ser. No. 326,060, Jan. 23, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,630

Int. Cl.² E04G 21/14

U.S. Cl. 52—747 4 Claims



1. A method of assembling a surface covering having a plurality of covering elements, each element having a face covered with pile fibers of a type that extend beyond the edges of said element unless restrained, comprising the steps of:

applying a pile restraining tool at the free ends of the pile at an edge of an installed element that is adjacent to the location wherein an additional element is to be installed, said pile fibers extending forwardly of said edge and into said location to a first position and said tool being applied to said fibers at said first position,

manipulating said tool rearwardly in a direction away from said location and said first position to a second position slightly inwardly of said installed element edge so as to restrain said pile and prevent it from extending into said location, and

inserting said additional element into said location such that said restrained pile is prevented from being pinched between adjacent elements during said assembling.

3,938,296

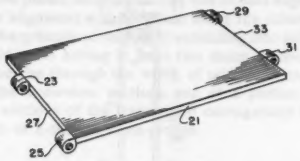
ELEMENTS FOR CONNECTING BOARDS OR PLATES

Gil Weiss, 229 Nir-Zvi, Ramle, Israel

Continuation-in-part of Ser. No. 310,316, Nov. 29, 1972, abandoned. This application May 13, 1974, Ser. No. 469,151

Int. Cl.² F16B 12/12

U.S. Cl. 52—753 C 14 Claims



1. An element for connecting boards or plates, with one another, said element comprising a ring having a cross-section of three-quarter of a circle with a right angular point, the straight sides thereof tangentially joining the ends of the three-quarter circle, said element including a throughgoing opening co-axial with the ring, for receiving a rod for enabling said straight sides of at least one connector element to be abuttingly attached to an edge of the board and to enable said round part to rotate said board into any angular position for connecting same to another board to which at least one other connecting element is abuttingly engaged.

3,938,297

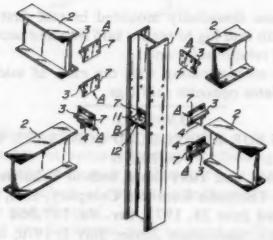
FITTINGS FOR CONNECTING COLUMNS AND BEAMS OF STEEL FRAME CONSTRUCTION

Kuniaki Sato, Hiratsuka; Kozo Toyama, Tokyo; Eiji Matsushita, Fujisawa; Akio Tomita, and Shuei Suzuki, both of Tokyo, all of Japan, assignors to Kajima Corporation, Tokyo, Japan

Filed Feb. 21, 1975, Ser. No. 551,914

Int. Cl.² F16B 7/00

U.S. Cl. 52—758 F 3 Claims



1. Fittings for connecting columns and beams of a steel frame construction, comprising an upper flange fitting and a lower flange fitting, said upper flange fitting comprising a substantially rectangular base plate to be connected to said column having centrally a horizontally continuous thicker portion from which the base plate is tapered, a horizontal protrusion projecting from said thicker portion in opposition to a flange of said beam, a vertical protrusion in opposition to a web of said beam and projecting from said base plate to form with said horizontal protrusion a T-shaped protrusion, and seats formed on the base plate and formed with holes for bolts, and said lower flange fitting comprising a substantially rectangular base plate to be connected to said column having centrally a horizontally continuous thicker portion from which the base plate is tapered, a horizontal plate projecting from said thicker portion for supporting a lower flange of said beam and formed with holes for bolts, a vertical reinforcement plate vertically extending downwardly from the horizontal plate to

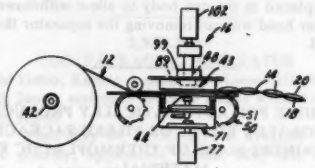
form therewith a T-shaped shelf, and seats formed on said base plate and formed with holes for bolts.

3,938,298

SYSTEM FOR INFLATION AND SEALING OF AIR CUSHIONS

Robert A. Luhman, Township of Cylon, County of St. Croix, Wis., and John R. Ward, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 20, 1974, Ser. No. 471,689
Int. Cl.² B65B 31/04
U.S. Cl. 53—7 **11 Claims**



11. A method for inflating and sealing an inflatable cushion comprising the steps of:

providing a cushion having two thin flexible films, each film comprising a heat sealable thermoplastic forming at least one surface of the film, one of said films having an opening, and said films being positioned with their thermoplastic surfaces in face-to-face contact and being fused together in discrete areas to define a plurality of inflatable chambers between the films disposed around and each having a separate inlet passageway communicating with the opening;

positioning a nozzle having a terminal end into the opening of the cushion with the terminal end of the nozzle contacting the portion of the film extending across the opening;

tensioning the cushion around the nozzle to provide a predetermined conical shape for a portion of the cushion around said nozzle;

smoothing the predetermined conical shaped portion of the cushion around said nozzle;

applying a source of air under greater than atmospheric pressure through said nozzle so that the air will be evenly deflected by the film across said opening simultaneously into all of the inlet passageways to inflate the chambers of the cushion;

allowing the edges of said tensioned cushion to move toward said nozzle while maintaining said tensioning of the cushion as the edge to edge dimensions of the cushion decrease during the inflation thereof; and

applying heat and pressure to seal shut the inlet passageways of the chambers around the opening subsequent to inflation of the cushion.

3,938,299

PACKAGING SYSTEM AND METHOD

Bernard Lerner, Hudson, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Continuation-in-part of Ser. No. 336,560, Feb. 28, 1973, which is a continuation-in-part of Ser. No. 139,453, May 3, 1971, Pat. No. 3,815,318. This application May 7, 1974, Ser. No. 467,791
Int. Cl.² B65B 31/00, 5/00, 7/06
U.S. Cl. 53—22 B **11 Claims**

7. A method of packaging articles in a web-like container strip defining a series of container portions comprising:

a. stationing a container strip at a supply station;

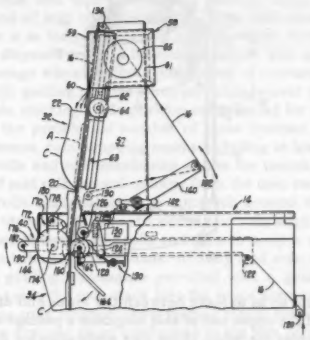
b. providing a loading station at which articles to be packaged are inserted into successive container portions;

c. establishing a work station at a location generally below the loading station and at which an operation is performed on successive loaded container portions;

d. stationing a container strip feeding means at a location generally above the level of the work station and below the level of the loading station with at least part of said strip feeding means interposed between said work and loading stations;

e. feeding the container strip from said supply station through said loading and work stations including:

i. advancing the container strip along a path of travel extending from said supply station to said feeding means;



ii. moving the container strip upwardly from said feeding means in a loop-like path of travel which extends past said loading station and proceeds downwardly toward said work station to said feeding means;

iii. advancing the container strip through said feeding means to said work station;

f. supporting the container strip at said loading station along a relatively rigid surface which extends along a a portion of said loop-like path of travel through a length at least equal to the length of the container portions of the container strip;

g. loading articles into container portions of the container strip supported at said loading station; and,

h. closely conforming loaded container portions to articles therein to expel air from the container portions as each successive container portion passes through said feeding means proceeding toward said work station.

3,938,300

ARRANGEMENT IN REFUSE CHUTES

Karl Bo Lennart Lovqvist, Nyvallsvagen 13, 802 39 Gavle, Sweden

Continuation of Ser. No. 339,686, March 9, 1973. This application Mar. 20, 1975, Ser. No. 560,655
Claims priority, application Sweden, Mar. 9, 1972, 3019/72
Int. Cl.² B65B 1/20
U.S. Cl. 53—124 E **10 Claims**

1. An arrangement for collecting refuse, comprising in combination:

a. a refuse collection room having walls including a floor and a ceiling,

b. a vertically disposed refuse discharge chute extending vertically upwardly through the ceiling of said refuse collection room, the lower end of said chute opening into said room at a point near the ceiling of said room,

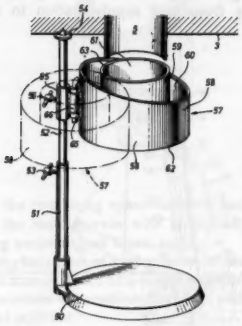
c. a magazine of hose-like impervious material which is to form a single elongated tubular receptacle for refuse, said impervious material being disposed in a folded condition,

wherein the folds extend substantially in a circumferential direction,

d. magazine holder means for confining said magazine of impervious material in an essentially ring-formed column that has a vertical axis that substantially coincides with the vertical axis of the outlet of said vertically disposed discharge chute,

e. said magazine holder means and said magazine forming a substantially vertical passageway for receiving refuse discharged from said discharge chute and

f. support means in said refuse collection room for supporting said magazine holder near the lower end of the refuse



chute so as to leave between the lower end of said chute and the upper end of said magazine a passage allowing air to enter the refuse chute pipe while allowing the hose-like impervious material to be inflated by the action of refuse discharged from said refuse discharge chute,

g. said magazine holder means being supported by said support means so that in a first position there will be a general axial alignment of the inlet of said ring-formed column with said discharge chute, and so that in a second position the said ring-formed column means will be wholly removed from alignment with said discharge chute.

3,938,301

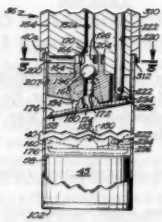
APPARATUS FOR INSERTING SEPARATOR PLATES IN CANS AND TAMPING THEM IN PLACE

Jack J. Rejsa, and Francis R. Reid, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Apr. 4, 1975, Ser. No. 564,238

Int. Cl.² B65B *61/20, 61/22*

U.S. Cl. 53—157 **7 Claims**



2. A placer and tamper for a can separator plate comprising:

a. a supporting framework,

b. a separator inserter head having a longitudinal axis and a free end adapted to hold one of said separator plates,

c. means for aligning a can body having a longitudinal axis with the longitudinal axis of the inserter head,

d. a means for establishing relative motion between the can body and the head along the axis of the can body and along said longitudinal axis of the head in a direction adapted to place the separator within the can body,

e. a vacuum duct means extending through the head and communicating through openings at the free end of the head to thereby establish suction at the free end of the head when the vacuum is applied to hold one of said separator plates thereagainst to reduce the air pressure within the can to prevent the accumulation or pressurization of air under the separator plate,

f. valve means for turning the vacuum on when the head is aligned with the plate to hold the separator plate on the head, and

g. a means for turning the vacuum off after the head has been placed in the can body to allow withdrawal of the inserter head without removing the separator thus introduced.

3,938,302

MACHINE FOR AUTOMATICALLY PRODUCING OPTIONALLY EMPTY OR FILLED PACKAGING CONTAINERS MADE OF THERMOPLASTIC FILM MATERIAL

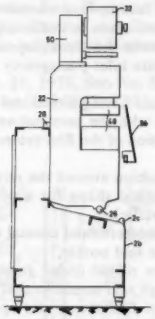
Henry Donnet, Falaise, France, assignor to Ste. d'Application Plastique Mecanique et Electronique Plastimecanique, Courbevoie, France

Filed Nov. 6, 1973, Ser. No. 413,193

Claims priority, application Germany, Nov. 9, 1972, 2254738

Int. Cl.² B65B *3/02, 43/08, 59/04*

U.S. Cl. 53—167 **8 Claims**



1. For use with an apparatus for producing containers from a web of thermoplastic film said apparatus comprising means for feeding said film from a supply roll and passing said film successively through processing devices, including heating, shaping, sealing and stamping units, the hereinafter defined invention comprising an improved, combined supporting structure and housing for said apparatus formed of structural metal sections and a sheet metal covering wherein there is provided:

1. an initial compartment having a generally cubic configuration adapted to support and enclose therein at one side thereof the said supply roll and associated feed means, said compartment having a removable cover to afford access to the supply roll and feed means; the other side of said compartment serving as an enclosure for the control mechanisms of the various process devices;

2. an elongated compartment which is L-shaped in transverse section and which is generally coextensive with the length of the remainder of the apparatus and which forms a continuation of the cubical compartment, the horizontal leg of the L-shape being in longitudinal alignment with the said one side of the cubical compartment and the

vertical leg of the L-shape being in line with the said other side of the cubical compartment; the horizontal leg of the L-shaped compartment having a transversely inclined sheet metal covering which slopes downwardly and outwardly from the vertical leg toward the forward terminal end of the horizontal leg; and

3. a plurality of spaced apart, forwardly and outwardly facing generally C-shaped housings supported in the angle of the elongated L-shaped compartment, the lower limb of each of said C-shaped housings overhang, in spaced relation thereto, the sloping top of the horizontal leg of the L-shaped compartment, each of said C-shaped housings adapted to enclose and protect in its upper and lower limbs the operating mechanism of a respective processing device.

3,938,303
COIN PACKAGING APPARATUS

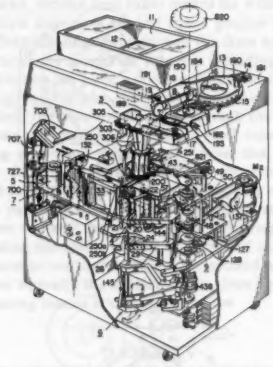
Masatoshi Ushio; Kazuto Asami, and Matono Hirokuni, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed May 28, 1974, Ser. No. 474,150

Claims priority, application Japan, May 25, 1973, 48-58952; June 8, 1973, 48-64973

Int. Cl.² B65B *11/04*

U.S. Cl. 53—212 **4 Claims**



1. In a coin packaging apparatus for packaging a preselected number of coins of the same denomination in the form of a neat stack, the apparatus having a rotary disc adapted to receive a batch of coins to be packaged and to send out outward said received coins by utilization of centrifugal force of the disc, a wall member provided at the peripheral part of said rotary disc the height of which above the disc is adapted to be regulated in accordance with the thickness of coins, a coin passageway extending from said rotary disc at said wall member so that the coins on said rotary disc are thereby centrifugally sent out one by one into said coin passageway, at least one wall composing said passageway being adjustably spaced from the other wall of said passageway, conveyor means provided above said passageway and adapted for conveying the coins passed under said wall member and thence sent into said passageway; coin counting means provided intermediate the length of said passageway and provided with means adapted to block passage of coins when a preselected number of coins has passed through said passageway, a coin take-out passage provided adjacent the end of said coin passageway for taking out the counted coins, therefrom, a coin guiding passage provided adjacent the end of said coin passageway for guiding the coins to a position adapted for stacking the coins, a change-over mechanism on which said coin guiding passage and said coin takeout passage are mounted and comprising a change-over member movable between a coin stacking mode position and a coin counting mode position, the coin take out passage being aligned with the end of said coin passageway when said changeover mechanism is in the coin counting mode position and said coin guiding passage being aligned with the end of said coin passageway when said changeover mechanism is in the coin stacking mode position, coin stacking means disposed so as to be communicated with said coin guiding passage when said coin passageway is communicated with the coin guiding passage when said change-over member is in the coin stacking mode position and adapted for aligning in a stack the preselected number of coins counted by said counting means, coin wrapping means including at least three wrapping rolls and roll transferring means for transferring at least one of said rolls toward or away from the coin stack, said wrapping rolls being adapted to approach around the coin stack after the stack of coins stacked at said coin stacking part is introduced between said rolls and then to wrap a wrapper sheet around the coin stack while rotating said coin stack, a coin stack guiding mechanism provided with a guide lever adapted to guide the coin stack into the space surrounded by the wrapping rolls, wrapper sheet feeding means for feeding a piece of the wrapper sheet conformed to the size of the coin stack toward the peripheral surface of said coin stack and rotated in the coin wrapping position, and fold-crimping means comprising a pair of crimping hooks adapted to fold-crimp and lateral edges of said sheet of wrapper over the opposite ends, respectively of the coin stack after said sheet of wrapper has been wound around said coin stack; the improvement comprising, in combination, first cam means operatively associated with said wall member for setting the vertical position of said wall member, second cam means operatively associated with the movable wall of said coin passageway for setting the position of said adjustably movable wall to set the width of said passageway so as to correspond to the width of the coins to be stacked, at least one first adjustable shaft means for adjusting the apparatus to operate in the counting mode and coupled to said first and second cam means for actuating said cam means to set the positions of said wall member and adjust the width of the coin passageway in accordance with the coins being handled, cylinder diameter selecting means coupled to said coin stacking means for selecting the inside diameter of the stacking space in said coin stacking means, third cam means operatively associated with the movable roll of said wrapping rolls for moving the movable roll to a position corresponding to the diameter of coins in a stack and for guiding the coin stack into the coin wrapping position, fourth cam means operatively associated with said fold-crimping means for setting the fold crimping means to a position corresponding to the denomination of the stack of coins to be wrapped, setting means adapted operatively associated with said wrapper sheet feeding part for driving said feeding part for feeding a wrapper sheet corresponding to the denomination of the coins of the coin stack to be wrapped, second adjustable shaft means for adjusting the apparatus to operate in the wrapping mode and coupled to said cylinder diameter selecting means, said third cam means, said fourth cam means, and said setting means for setting said wrapper sheet feeding part, coin denomination selecting means, and control means coupled between said denomination selecting means and said adjustable shaft means for driving only said first adjustable shaft means when the apparatus is in the counting mode and for driving both said first and second adjustable shaft means when the apparatus is in the wrapping mode.

3,938,304

WRAPPING DEVICE

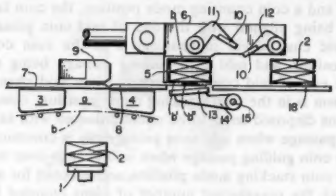
Yoshikazu Utsumi, 47 Higashiura-cho Daigo Misasagi, Fushimi, Kyoto, Kyoto, Japan

Filed Aug. 27, 1973, Ser. No. 391,778

Claims priority, application Japan, July 19, 1973, 48-81500

Int. Cl.² B65B *11/26*

U.S. Cl. 53—229 **2 Claims**



1. A device for tightly wrapping an object in a wrapping paper said device comprising

- **a. pusher means for pushing said object such that the top of said object engages said wrapping paper and the ends of the wrapping paper extend below the object along the sides thereof;**
- **b. suction means positioned below said object, after it has been pushed, for holding the ends of said wrapping paper such that said wrapping paper is tensioned over the top of said object;**
- **c. plate means positioned over said suction means and below the level of the bottom of said object;**
- **d. means to move one of said plate means relative to said object;**
- **e. holding means for holding said object after said wrapping paper has been tensioned thereon as said plate means is moved and for moving said object relative to the other plate means whereby the wrapping paper is folded under the object, said holding means comprising an angle plate for engaging the top and one side of the object and a first turning arm means for engaging the other side of said object;**
- **f. a second turning arm means positioned to engage the bottom of said object after it has been wrapped and while it is engaged by said holding means; and**
- **g. means for simultaneously turning said first and second turning arm means away from said object so that the bottom of said object remains in contact with said second turning arm means and is disengaged from said holding means.**

3,938,305

APPARATUS FOR SEALING CONTAINERS

Helmut Jansen, and Klaus Vollmer, both of Viersen, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

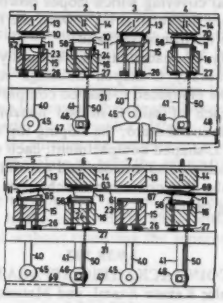
Filed Feb. 18, 1975, Ser. No. 550,736

Claims priority, application Germany, Feb. 18, 1974, 2407637

Int. Cl.² B65B *7/28, 51/14*

U.S. Cl. 53—300 **7 Claims**

1. In an apparatus for sealing packing containers consisting at least partially of a bondable material under the action of pressure and heat using a first and a second bonding unit, the improvement comprising an endless rotatable conveyor, means for rigidly disposing said first and second bonding units with mutual spacing on said endless rotatable conveyor, and means disposed on a common path of rotation of said first and second bonding units for removing a container sealed with a first bonded seam from the operating zone of said first bonding unit and for transferring this container to the operating zone of said second bonding unit.



3,938,306

SPINNING AND WINDING OF YARNS

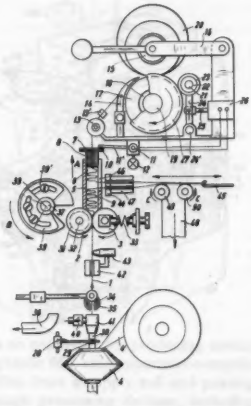
Karl Bous, Sternstr. 74, 56 Wuppertal 2, Germany

Filed Aug. 20, 1973, Ser. No. 390,165

Claims priority, application Germany, Aug. 26, 1972, 2242151

Int. Cl.² D01H *15/00*

U.S. Cl. 57—34 R **13 Claims**



1. An apparatus for continuously spinning and subsequently winding yarn which comprises at least one yarn-spinning means, yarn-winding means for receiving and winding the spun yarn, yarn storage means located between said spinning means and said winding means, means adapted to selectively feed yarn to and from said storage means, adjustable control means located between said spinning means and said winding means adapted to govern the rate of removal of yarn from said yarn storage means, means for detecting a fault in the yarn disposed in the path of said yarn passing from said yarn-spinning means to said storage means, yarn-marking means actuated by the fault-detecting means and located adjacent said yarn path and adapted to mark the yarn adjacent the detected fault, means sensitive to the mark made by said fault-detecting means disposed adjacent said yarn path, a yarn knotter and cooperating thread clamp actuated by the sensitive means upon sensing a mark made by said fault-detecting means, said knotter and clamp joining yarn portions adjacent the yarn

portion containing said fault, and means for engaging and removing the yarn fault-containing portion from the joined yarn portions after actuation of said knotter and clamp.

3,938,307

DRAWING AND TEXTURING BY FALSE TWIST CRIMPING OF SYNTHETIC TEXTILE FILAMENT

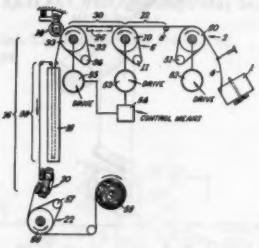
Norbert Hooper, Castleton near Rochdale, England, assignor to Platt International Limited, Lancashire, England

Filed Mar. 28, 1974, Ser. No. 455,876

Claims priority, application United Kingdom, Apr. 2, 1973, 15697/73

Int. Cl.² D01H *13/02*; D02G *1/02*; D01H *13/28*

U.S. Cl. 57—34 HS **8 Claims**



3. In an apparatus for drawing and texturing by false twist crimping a synthetic filament yarn comprising first feed roller means for forwarding yarn from a yarn supply at a first speed to a draw zone, second feed roller means for withdrawing yarn from the draw zone at a second speed greater than the first speed to effect drawing of the yarn in the draw zone, texturing means for receiving the drawn yarn and including yarn heating means for heating the yarn, a cooling zone in which the heated yarn is cooled and a false twist crimping means for inserting false twist into the yarn to run back through the cooling zone to the heating means and withdraw feed roller means for withdrawing yarn from the texturing zone, the improvement comprising third feed roller means for receiving yarn from said second feed roller means and for engaging and positively driving the yarn at the rate of rotation of the said third feed roller means to feed the yarn to said texturing means at a speed less than the speed of said second feed roller means to allow the yarn to contract between the second and third feed roller means whereby the tension of the drawn yarn received by the texturing means is controlled.

3,938,308

METHOD AND DEVICE FOR TRANSFERRING FRESH BOBBINS FROM A BOBBIN SUPPLY DEVICE TO A CONVEYER BELT OF A TEXTILE MACHINE

Ikuo Komura, Toyota; Hideo Tamai, Kariya; Takayuki Morita, Obu, and Masanao Kobayakawa, Anjyo, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

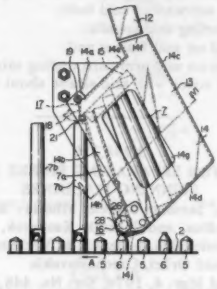
Filed Dec. 20, 1974, Ser. No. 534,723

Claims priority, application Japan, Dec. 26, 1973, 49-2498[U]

Int. Cl.² D01H *9/18*

U.S. Cl. 57—52 **5 Claims**

2. In a textile machine provided with a doffing and donning apparatus utilizing a conveyer belt for temporarily supporting full size yarn packages doffed from said textile machine and fresh bobbins thereon, and a fresh bobbin supply device disposed at an outend frame thereof, said conveyer belt provided with a plurality of first pegs for supporting said full size yarn packages doffed from said textile machine and a plurality of second pegs for supporting said fresh bobbins supplied from said fresh bobbin supply device, said fresh bobbin supply device provided with a chute for discharging said fresh bobbins toward said second pegs one by one; a fresh bobbin transferring device disposed at an intervening position between said chute of said fresh bobbin supply device and an end portion of said conveyer belt, said transferring device comprises a first means for temporarily reserving a plurality of fresh bobbins in substantially upright condition and supplying said fresh bobbins onto said second pegs one by one when said conveyer belt is driven before carrying out the donning operation, a second means for regulating motion of mounting said fresh bobbins onto said second pegs, said first means comprising a casing provided with an inlet aperture facing said chute of said bobbin supply device and a discharging outlet for permitting free passage of said fresh bobbins therefrom and a bottom guide plate inclined downward from a side of said inlet aperture to a side of said discharging outlet; said bottom guide plate provided with a forwardly extended portion for standing a fresh bobbin thereon, said forwardly extended portion provided with a cut-out portion which permits free passage of said second pegs when said second pegs approach along a passage thereof inclined to said forwardly extended portion, said regulating means disposed on said casing at a position adjacent to said forwardly extended portion.



3,938,309

SPINNING APPARATUS FOR GLASS-FIBER YARN

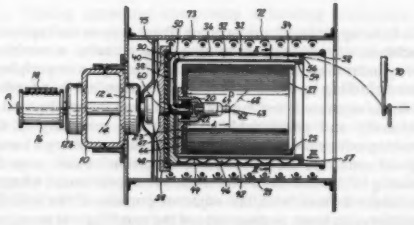
Aloys Greive, Munster, Germany, assignor to Hamel G.m.b.H., Zwirnmaschinen, Munster, Germany

Filed May 29, 1973, Ser. No. 364,552

Claims priority, application Germany, May 30, 1972, 2226284

Int. Cl.² D01H *7/86*, *7/22*

U.S. Cl. 57—58.86 **21 Claims**



1. A yarn-spinning apparatus especially for low tensile strength multithread yarn comprising:

a spindle lying along and rotatable about an axis;

a flyer having a base attached to said spindle and a sleeve extending axially from said base, said spindle and said flyer being formed with a passage opening axially at one end away from said base at said axis and opening axially

at the other end away from said base at a location offset from said axis on said sleeve;

a yarn holder carried on and rotatable relative to said spindle and including an axially open cup snugly receiving an annular coreless yarn package and a tube lying along said axis in line with said one end of said passage and having a mouth opening away from said base and lying within said package;

means for preventing said holder from rotating about said axis;

a thread brake in said tube;

a bell cover engageable with the end of said sleeve remote from said base and formed with a hole lying on said axis and a neck surounding said hole;

a frame supporting said spindle;

an arm pivotal on said frame; and

bearing means on said arm surrounding said neck for rotation of said cover with said sleeve about said axis.

3,938,310

APPARATUS FOR SEPARATING FIBERS IN OPEN-END SPINNING MACHINES

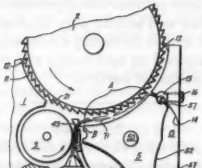
Stanislav Didek; Jaroslav Storek; Miloslav Kubovy; Zdenek Svec; Jan Hrdina, and Jaromir Kasparek, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Mar. 4, 1974, Ser. No. 448,010

Claims priority, application Czechoslovakia, Mar. 8, 1973, 1655-73

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.91 **18 Claims**



1. In an apparatus for separating fibers in open-end spinning machines, comprising a housing having a cavity, a combing-out cylinder mounted in the cavity and having on its periphery a card clothing by which a fibrous sliver supplied by a feeding device is separated, and means including an insert disposed in the cavity and positionable adjacent the periphery of the combing-out cylinder for defining with said periphery a combing-out zone, the cross-section of a portion of said zone decreasing in the fiber flow direction, the improvement wherein the insert defines, with the adjacent portion of the cylinder periphery, an input portion only of the combing-out zone, and wherein the insert comprises, in combination, at least two peripherally spaced concave operating faces cooperable with the cylinder periphery for providing different combing-out zones therebetween, means for peripherally adjusting said insert into positions in which any desired one of said concave operating faces cooperates with the cylinder periphery to provide the combing-out zone, and means for holding the insert in its adjusted position.

3,938,311

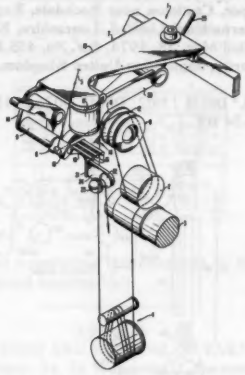
YARN STOP-MOTION DEVICE

Charles M. Rice, Candler, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed May 23, 1974, Ser. No. 472,829

Int. Cl.² D01H *13/16*

U.S. Cl. 57—87 **14 Claims**



1. A yarn stop-motion device for use with a yarn-processing apparatus, which comprises a single yarn break-detector means and yarn-severing means positioned close to each other, the point at which a yarn break is detected by the yarn break-detector means and the point at which the yarn is severed by the yarn-severing means being positioned above or on the same side of the yarn-processing apparatus, and said yarn break-detector means detecting yarn breaks occurring along the entire yarn path of the yarn passing through the yarn-processing apparatus and being positioned to contact the yarn in the yarn path downstream of the yarn-processing apparatus.

3,938,312

YARN SPINNING APPARATUS

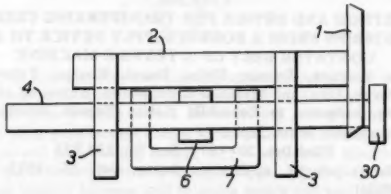
John Michael Noguera, 1 Greville House, Kinnerton St., London S.W. 1, England

Filed Sept. 20, 1974, Ser. No. 507,985

Claims priority, application United Kingdom, Sept. 21, 1973, 44502/73

Int. Cl.² D01H *1/12, 1/20, 1/24*

U.S. Cl. 57—103 **1 Claim**



1. An open end yarn spinning apparatus comprising a member having a collecting surface that, in operation, is adapted to be rotated while having deposited thereon fibers to be spun into yarn, said member including a first shaft, two pairs of rollers engaging and supporting said first shaft at portions of the latter, said rollers being of substantially greater diameter than the diameter of the portions of the first shaft engaged thereby, second and third shafts, one roller of each said pair being mounted on said second shaft and the other roller of each said pair being mounted on said third shaft; an opening

roller mounted on one of said second and third shafts to rotate therewith; and an electric motor, said third shaft is drivingly engaged with said electric motor to be driven thereby to drive said second shaft via the rollers mounted on said third shaft, the first shaft and the rollers mounted on the second shaft.

3,938,313

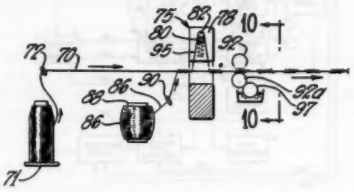
REINFORCEMENT FOR TIRES AND METHOD OF MAKING SAME

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 312,003, Dec. 4, 1972, Pat. No. 3,857,229, which is a division of Ser. No. 107,193, Jan. 18, 1971, Pat. No. 3,776,293, which is a division of Ser. No. 664,020, Aug. 29, 1967, Pat. No. 3,631,667. This application May 14, 1974, Ser. No. 469,722

Int. Cl.² D02G *3/38, 3/40, 3/48*

U.S. Cl. 57—149 **10 Claims**



1. A composite cord construction comprising a substantially or essentially continuous core yarn and a continuous wrap of a second yarn, said second yarn being longer per unit length of said core yarn, said excess length of second yarn being present along said core yarn in spaced islands or regions along the length of said core yarn, said islands each comprising a given length of said second yarn in the form of a loop, initially starting at the core yarn, proceeding laterally outwardly to a midpoint and thence back to the core yarn, which described loop is wrapped about said core yarn so that the length of yarn in one-half of said loop proceeds in one spiral direction about said core yarn and the length of said yarn in the other half of said loop proceeds in the opposite spiral direction, and means for securing said second yarn about said core yarn.

3,938,314

FALSE-TWIST TEXTURING PROCESS WITH HOLLOW FRICTION TWIST TUBES

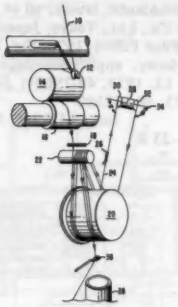
George Roy Trammell, Martinsville, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 10, 1974, Ser. No. 468,684

Int. Cl.² D02G *1/02*

U.S. Cl. 57—157 TS **6 Claims**

1. In the false-twist texturing process wherein synthetic thermoplastic yarn is passed continuously through a heating zone and through one or more hollow friction-twist tubes fitted with toroidal bushings to heat-set latent crimp in the yarn; the improvements which comprise feeding the yarn under a tension T_1 from the heating zone over a high friction toroidal surface of a synthetic elastomer located at an end of a friction-twist tube at an angle α of at least 85° to the yarn path, then passing the yarn over a low friction toroidal surface of an extremely hard material located at an end of a friction-twist tube at an angle β of 50° to 80° to the yarn path and having a surface velocity no greater than that of the high friction surface, and withdrawing the yarn from the friction-



twist tube under a tension T_2 where T_2/T_1 has a value of 1 to 2.

3,938,315

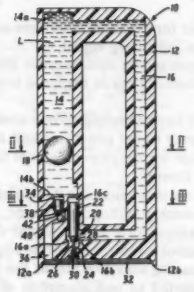
ADJUSTABLE INTERVAL TIMER

Miklos Von Kemenczky, Greenbrook, N.J., assignor to Paul Guilden, New York, N.Y.

Filed June 20, 1974, Ser. No. 481,140

Int. Cl.² G04F *1/04, 1/08*

U.S. Cl. 58—1 R **16 Claims**



1. Timing apparatus comprising a housing containing a fluid, conduit means in said housing for circulating said fluid, body means in said conduit means for gravity-induced movement between first and second preselected locations in said housing and means for controlling circulation of fluid in said conduit means, thereby controlling the time elapsed in said gravity-induced movement of said body between said first and second locations, said fluid circulation control means comprising a valve having a fluid conducting element slidably supported in said conduit means, closure means for closing said fluid conducting element, and adjustable means for supporting said fluid conducting element in engaging relation with said closure means when said housing is in upstanding disposition whereby fluid flow in said conduit means is adjustably restricted in a first circulating direction, said fluid conducting element sliding from said engaging relation with said closure means when said housing is inverted from said upstanding disposition thereof whereby fluid flow in said conduit means is substantially unrestricted in a second circulating direction opposite to said first circulating direction.

3,938,316
TEMPERATURE COMPENSATED ELECTRONIC TIMEPIECE

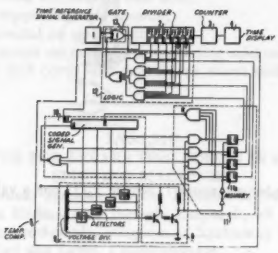
Shigeru Morokawa, Tokorozawa; Yukio Hashimoto, Niiza, and Yasuhiko Nishikubo, Iruma, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1974, Ser. No. 440,240

Claims priority, application Japan, Feb. 10, 1973, 48-16720; July 13, 1973, 48-79084; July 25, 1973, 48-83848; Nov. 23, 1973, 48-132380

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 R **2 Claims**



1. An electronic timepiece comprising:

an oscillator having an output frequency variable with temperature and forming a time reference signal generator for generating a time reference signal at the oscillation frequency;

a time-count unit-signal former connected to said generator for dividing said time reference signal to form time-count unit-signal;

a time counter for counting said time-count unit-signals to form a time-indicating signal;

a display connected to said counter for providing a visual representation of time in response to said time-indicating signal;

a temperature compensating device connected between the time reference signal generator and the time count unit-signal former for receiving a signal from the time count unit-signal former;

the temperature compensating device having a temperature sensitive means, a voltage generator, a coded signal generator, a temperature coded signal discriminator, a frequency control circuit, and a frequency addition circuit;

in the temperature sensitive means the emitter of a transistor is connected to one electrode of a constant voltage supply source and the collector is connected through a resistor to the other electrode of said constant voltage supply source and delivering a digital signal reversed from an initial state if the base-emitter voltage of the transistor becomes equal to the threshold value of the transistor at a given temperature when the change of a voltage-current characteristic is effected by the temperature change at the base-emitter junction;

the voltage generator for supplying different voltages to the base-emitter of the temperature sensitive device by changing-over with an electronic switch such as a transmission one wherein a resistor is connected in series between one and the other electrodes of the said constant voltage supply source;

the coded signal generator comprising a shift register receiving an input clock signal from the time-count unit-signal former, controlling the electronic switch of the voltage generator and delivering a signal as the standard of a temperature coded signal;

the temperature coded signal discriminator discriminating the temperature coded signal from the output signal of the temperature sensitive means and that of the coded signal generator by an NAND gate and memorizing it until the next temperature coded signal;

the frequency control circuit forming a thin pulse from the output of the temperature coded signal discriminator and that of the time-count unit-signal former; and

the frequency addition circuit comprising an EXCLUSIVE-OR GATE circuit adding the output signal of the frequency control circuit to the time reference signal generator, whereby it compensates the change of the oscillating frequency in the time reference signal generator caused by the temperature change.

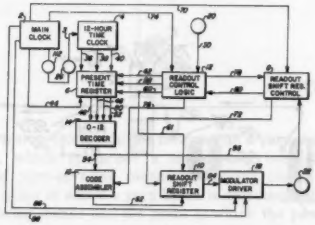
3,938,317
SERIAL TIME READ OUT APPARATUS

John D. Spano, 8220 E. Garfield Apt. M-23, Scottsdale, Ariz. 85257

Filed Aug. 10, 1974, Ser. No. 498,553

Int. Cl.² G04C *3/00*; G04B *19/06*

U.S. Cl. 58—23 R **10 Claims**



1. Apparatus for serially reading out time comprising, in combination:

clock means for providing clock pulses;

counter means for counting pulses from the clock means and for providing output pulses in terms of minutes, 10 minutes, and hours,

register means connected to the counter means for storing and shifting pulses representing time information in terms of minutes, 10 minutes, and hours;

encoding means connected to the register means for serially encoding the pulses representing time information into pulses of varying time lengths;

control means for controlling the storing, shifting, and encoding of pulses; and

output means for providing a serial output of the encoded time information.

3,938,318
WRIST WATCHES

Dean Robert Collins, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 68,207, Aug. 31, 1970, abandoned. This application June 8, 1973, Ser. No. 368,372

Int. Cl.² G04C *19/02*; H02J *3/14*

U.S. Cl. 58—50 R **6 Claims**

1. A timing device comprising in combination:

a case,

a plurality of liquid crystal display cells mounted in said case, each cell comprising a pair of spaced-apart substrates and a film of liquid crystalline material interposed therebetween, at least one of said substrates being optically transmissive and having an optically transmissive and electrically conductive layer formed on one surface thereof, the other substrate having first and second major surfaces on opposite sides thereof, a plurality of electrodes formed on said first surface of said other substrate, said plurality of electrodes being arranged to effect a

preselected display in response to energization of selected ones thereof,

light generating means positioned within said case for directing light upon said cells,

a voltage source connected to said light generating means for energization thereof, and

CMOS circuit means within said case and operable to apply an electric field between selected electrodes of each of said cells and said electrically conductive layer to thereby cause said liquid crystalline material between said selected electrodes and said electrically conductive layer to scatter light emanating from said light generating means, said CMOS circuit means including a timing source operable to produce a chain of pulses defining a reference

frequency, a countdown chain of CMOS divide by two logic gates electrically connected to said timing source and operable to reduce said reference frequency to a preselected pulse rate, a CMOS logic circuit electrically connected to the output of said countdown chain, said logic circuit being operable to select according to a preselected pattern the appropriate electrodes of said cells required to be energized in order to effect a display of the desired information, and a CMOS driver circuit electrically connected to the output of said logic circuit and operable to apply a voltage from said voltage source across the liquid crystalline material between electrically conductive layers and selected electrodes indexed by said logic circuit.

3,938,319

METHOD OF AND APPARATUS FOR PREVENTING COMPRESSOR STALL IN A GAS TURBINE ENGINE

Faulkner C. Thomson, Camp Springs, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 13, 1974, Ser. No. 497,017
Int. Cl.[2] F02C *9/08*
U.S. Cl. 60—39.03 **5 Claims**

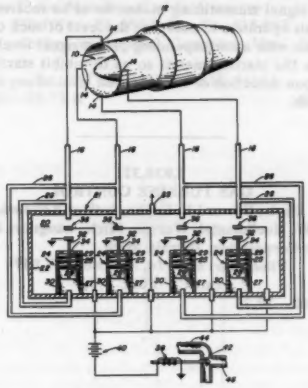
4. A method of anticipating and preventing compressor stall caused by air distortion in the air inlet of a gas turbine engine comprising the steps of:

sensing the total air pressure at a plurality of spaced locations about the periphery of said inlet;

producing a reference pressure proportional to the steady state pressure in said inlet;

generating a signal when the differential pressure between the pressure at any one of said spaced locations exceeds said reference pressure by a predetermined magnitude, said predetermined magnitude being indicative of air distortion in said inlet sufficient to cause compressor stall; and

altering the operating conditions of said gas turbine engine



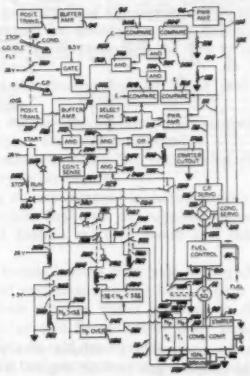
in response to said signal to thereby prevent compressor stall.

3,938,320

STARTING SYSTEM FOR A HELICOPTER POWER PLANT CONTROL

Robert E. Nelson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 17, 1974, Ser. No. 489,264
Int. Cl.[2] F02C *7/26, 9/04*
U.S. Cl. 60—39.14 **3 Claims**



1. A control system for a combustion engine adapted for remote power control and starting and stopping of the engine comprising, in combination, engine control means generating a power output level command signal, load control means generating a load control signal effective to vary the power requirement of the load driven by the engine, fuel control means for the engine effective to meter fuel to the engine to control engine power level, a first servomechanism operative to adjust the fuel control means in response to the power output level command signal, a second servomechanism operative to adjust the fuel control means in response to the load control signal, means responsive to the power output command signal effective to transmit a first driving signal to the first servomechanism, means responsive to the load control signal effective to transmit a second driving signal to the

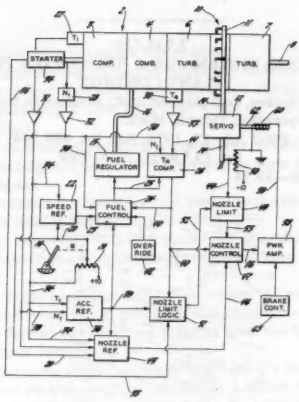
second servomechanism; starting means connected to the engine operable to start the engine; and a fault detecting logic system connected to the two said signal generating and the two said signal transmitting means so as to receive the four said signals operative to compare the level of each of the four said signals with a corresponding preset signal level and connected to the starting means so as to inhibit starting of the engine upon detection of an undesired level of any of the four said signals.

3,938,321

GAS TURBINE CONTROL

James L. Davis; Edward L. Lopke, both of Kokomo, Ind., and Louis W. Huellmantel, Warren, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1974, Ser. No. 447,847
Int. Cl.² F02C 9/02
U.S. Cl. 60—39.25 7 Claims



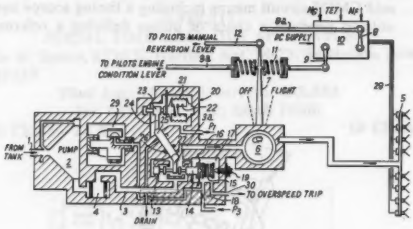
1. A system for control of a variable area power turbine nozzle of a gas-coupled gas turbine engine including a gas generator and a power turbine, the system including means responsive to a variable temperature reference signal and to turbine motive fluid temperature normally operative to vary the nozzle area to control turbine motive fluid temperature by opening the nozzle in response to excess of motive fluid temperature over the temperature reference signal; the system including means for generating a signal of a first upper limit to nozzle area at the initiation of gas generator acceleration in the normal operating speed range of the gas generator and means for generating a signal of a second upper limit to nozzle area larger than the first limit during gas generator acceleration below the normal operating speed range of the gas generator, the limit signal generating means being coupled to the means to vary the nozzle area so as to limit increase in opening of the nozzle in response to the temperature reference signal and the motive fluid temperature.

3,938,322

DEVICES FOR THE METERED SUPPLY OF LIQUID FUEL TO COMBUSTION ENGINES, MORE PARTICULARLY TO AIRCRAFT GAS-TURBINE ENGINES

Horace George Turner, Chandlers Ford, England, assignor to Plessey Handel und Investments, A.G., England

Filed Jan. 30, 1974, Ser. No. 438,142
Claims priority, application United Kingdom, Feb. 15, 1973, 7469/73
Int. Cl.² F02C 9/08, 9/10, 9/06
U.S. Cl. 60—39.28 R 5 Claims



1. Apparatus for supplying a controlled amount of fuel to a gas-turbine engine of an aircraft, said gas-turbine engine having a compressor, said apparatus comprising in combination:
1. a fuel tank for containing fuel for said engine;
2. a pump for delivering said fuel under pressure to said engine;
3. throttle means for enabling a pilot of said aircraft to adjust the flow of said fuel passing through said throttle means and destined for said engine;
4. a plurality of nozzles which are electrically energisable with such a mark/space ratio of energisation that they inject fuel into said engine in a rapid sequence of short uniformly time-spaced pulses;
5. electronic controller means for controlling said mark/space ratio of energisation of said nozzles by varying the ratio of the length of said pulses in relation to the length of the intervals between said pulses; and
6. fuel flow control means responsive to the difference in pressure between the fuel pressure at said throttle means and delivery pressure of said compressor, said flow control means being operative to maintain this pressure difference constant whereby the rate of said fuel delivery to said engine at any given setting of said throttle means is dependent only upon said mark space ratio set by said electronic controller means.

3,938,323

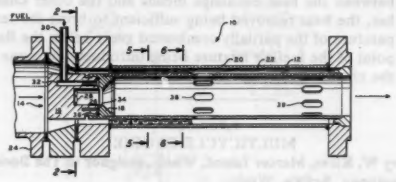
GAS TURBINE COMBUSTOR WITH CONTROLLED FUEL MIXING

Harold T. Quigg, and Robert M. Schirmer, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 208,247, Dec. 15, 1971, Pat. No. 3,826,079. This application Apr. 11, 1974, Ser. No. 459,937
Int. Cl.² F02G 3/00; F02C 7/22
U.S. Cl. 60—39.65 18 Claims

1. A combustor, comprising, in combination:
an outer casing;
a flame tube disposed within said casing and spaced apart therefrom to form an annular chamber between said flame tube and said casing;
a plurality of fins extending from the external surface of said flame tube into said annular chamber;
inlet means for introducing a swirling stream of air flowing in a downstream direction into the upstream end portion of said flame tube as the sole stream of air introduced into said upstream end portion of said flame tube; and

fuel inlet means for forming a sole annular stratum of fuel around said stream of air flowing into said flame tube by introducing said fuel in a direction toward and which is from tangential to less than perpendicular, but non-parallel, to the periphery of said stream of air to effect controlled mixing of said fuel and air at the interface therebetween and produce a sole annular fuel-air mixture for introduction into said upstream end portion of said flame tube.

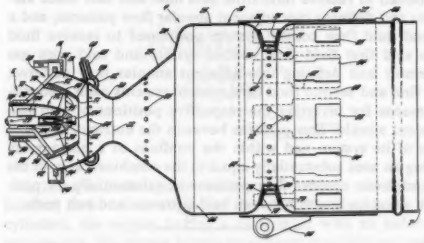


3,938,324

PREMIX COMBUSTOR WITH FLOW CONSTRICTING BAFFLE BETWEEN COMBUSTION AND DILUTION ZONES

Dean C. Hammond, Jr., Warren, Mich., and Ronald E. Quinn, Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1974, Ser. No. 531,874
Int. Cl.[3] F02C 7/22
U.S. Cl. 60—39.65 **4 Claims**



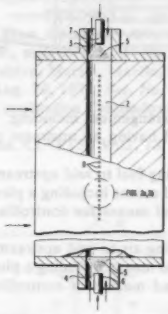
1. A combustion apparatus comprising, in combination, a housing providing a conduit for compressed air and a combustion liner in the housing, the liner being defined by wall means extending from an upstream end providing an inlet for combustion air to a downstream end providing an outlet for combustion products; the liner defining in flow sequence from the upstream to the downstream end a fuel introduction zone, a reaction zone, and a dilution zone; in which the improvement comprises barrier means extending into the liner from the wall means providing a constricted passage between the reaction zone and the dilution zone; and means providing continually open air entrance means between the said air conduit and the barrier means for entrance of cooling air into the barrier means; the barrier means defining distributed outlets for the cooling air from the barrier means into the interior of the liner.

3,938,325

AERODYNAMIC FLAME HOLDER

Wolfgang Bergt, Munich, Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Germany

Filed Nov. 12, 1973, Ser. No. 415,003
Claims priority, application Germany, Nov. 11, 1972, 2255306
Int. Cl.[2] F02G *3/00*; F02K *3/10*
U.S. Cl. 60—39.72 R **18 Claims**



1. Flame holder apparatus for a burner in a high velocity gas stream of an air-breathing jet engine; said apparatus comprising:

flame holder body means extendible spanwise across a high velocity gas stream of an engine, said flame holder body means having an aerodynamically streamlined external configuration with respect to the flow of said gas stream therearound,

mixing chamber means formed inside said flame holder body means,

fuel supply means opening into said mixing chamber means for supplying atomized fuel thereto,

air supply means opening into said mixing chamber means for supplying air thereto,

said mixing chamber means including means for premixing the atomized fuel and air supplied thereto to form a premixed fuel-air mixture inside said mixing chamber means.

and outlet means leading from said mixing chamber to the surface of said flame holder body means for supplying said fuel-air mixture under pressure to the gas stream flowing over said flame holder body means to support combustion in said gas stream,

wherein said fuel supply means includes means for supplying all fuel for supporting combustion in said burner by way of said mixing chamber such that all fuel is supplied through said, outlet means in a premixed condition ready for ignition,

wherein said mixing chamber means is formed as a hollow space having a longitudinal axis extending in the spanwise direction at right angles to the flow of said gas stream over the entire span of the flame holder body means,

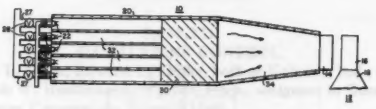
wherein inlet duct means are provided at at least one spanwise end of said flame holder body means, and

wherein said fuel supply means and said air supply means both open into each of said inlet duct means in the direction of the longitudinal axis of said hollow space such that the fuel is atomized and partially admixed with the air from said air supply means within said inlet duct means at a position upstream of the mixing chamber means.

3,938,326
CATALYTIC COMBUSTOR HAVING A VARIABLE TEMPERATURE PROFILE

Serafino M. DeCorso, Media, and Clifford E. Seglem, Wallingford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 25, 1974, Ser. No. 482,911
Int. Cl.² F02C 7/22
U.S. Cl. 60—39.74 R **4 Claims**

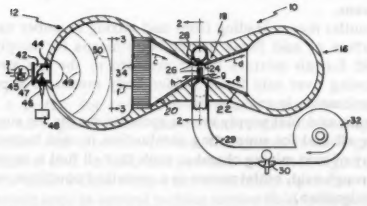


1. A combustor arrangement including:
a combustor shell having an upstream portion and a discharge end;
means for delivering fuel to said upstream end of said combustor shell said means including a plurality of fuel injector elements and means for controlling the flow of fuel therethrough;
means for delivering air to said upstream end of said combustor shell, said means including a plurality of air inductor elements and means for controlling the flow of air therethrough;
a catalytic member disposed within said shell intermediate said upstream portion and said discharge end;
a plurality of passageways providing confined fuel-air communication between each of said fuel injector elements and associated air inductor elements and said catalytic member, said passageways permitting delivery of various fuel-air mixtures to discrete portions of said catalytic member without intermixing thereof, the plurality of controllable fuel-air mixtures delivered to said catalytic member permitting a regulatable temperature output from each discrete portion thereof.

3,938,327
GAS GENERATOR

Leo L. Bailey, and David R. Kimmel, both of Green Acres Mobile Estates, Lot 58, Avenue F, Lake Worth, Fla. 33460

Filed Feb. 4, 1974, Ser. No. 439,421
Int. Cl.² F02K 7/02, 7/04
U.S. Cl. 60—39.77 **5 Claims**

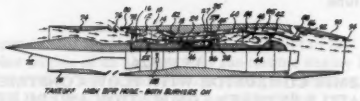


1. A gas generator of the pulse jet type having at least one combustion chamber with an ignition device and an exhaust opening, the combustion chamber being connected to another chamber by a reduced venturi member for creating pulsed pressure and velocity differentials between the chambers due to the flow of partially combusted gases therethrough in phased relation so as to cause a fuel/air mixture to be introduced into at least one of the chambers through inlet port means located in the venturi member and mixed with the partially combusted gases, and so as to cause an exhaust of combusted gases through the exhaust opening, the improvement comprising:
heat exchange means disposed in the combustion chamber adjacent the venturi member and remote from the exhaust opening for removing heat from the partially combusted gases as they move from the combustion chamber through the venturi portion into the other chamber, said inlet port means being disposed in the venturi member between the heat exchange means and the other chamber, the heat removed being sufficient to bring the temperature of the partially combusted gases below the flash point of the fuel/air mixture being introduced into one of the chambers through the venturi member.

3,938,328
MULTICYCLE ENGINE

Garry W. Klees, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 196,422, Nov. 8, 1971, Pat. No. 3,779,282, and a continuation-in-part of Ser. No. 226,850, Feb. 16, 1972, Pat. No. 3,792,584, and a continuation-in-part of Ser. No. 329,768, Feb. 5, 1973, Pat. No. 3,854,286. This application Dec. 17, 1973, Ser. No. 425,586
Int. Cl.² F02K 3/06
U.S. Cl. 60—262 **12 Claims**



1. A turbine engine comprising: an inlet for guiding ambient fluid into said engine; a forwardly located compression means having blade elements for compressing fluid passing through said inlet; a centrally located core gas generator including compression, combustion and turbine stages; an aft turbine driveably connected to said forward compression means, and located downstream of said core gas generator for acting on fluid passing through said inlet; a first fluid flow control system positioned to receive fluid from said inlet and said blade elements and defining two adjacent annular flow patterns; and a second fluid flow control system positioned to receive fluid from said first fluid flow control system and said core gas generator and defining two adjacent annular flow patterns; said first and second fluid flow control systems each comprising means for inverting the respective positions of said two adjacent annular flow patterns between the entrance and exit ends of its system and within the confines of a passageway having an area substantially equal to the combined area of the two adjacent annular flow patterns at substantially all positions along its length between said entrance and exit ends.

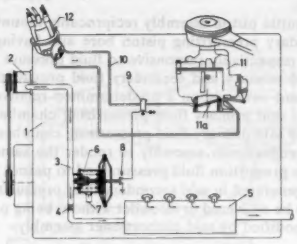
3,938,329
EXHAUST GAS DETOXICATION SYSTEM FOR A MOTOR VEHICLE COMBUSTION ENGINE

Richard van Basshuysen, Bad Wimpfen, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Germany

Filed Apr. 10, 1974, Ser. No. 459,663
Claims priority, application Germany, Apr. 14, 1973, 2318926
Int. Cl.² F02B 75/10
U.S. Cl. 60—284 **1 Claim**

1. An exhaust gas detoxication system for a motor vehicle combustion engine with external ignition comprising a distributor, an intake system comprising a carburetor with a throttle and an exhaust system with a reactor, said detoxication system having an air pump driven by the engine to deliver secondary air into the exhaust system, a blowoff valve arranged in the delivery line and having a valve body executing a stroke for opening a blowoff port when engine speed exceeds a certain value to regulate the flow of air supplied to the exhaust sys-

tem, a means to shift the ignition time to retarded ignition during the warm-up phase of the reactor, said means comprising a suction line between the carburetor downstream from the throttle and the distributor, an electrically-actuated valve



in said suction line for shifting the ignition time to advanced ignition at an engine speed of above said value, a switch in the electrical connection of said electrically-actuated valve, said switch being actuated by said valve body of the blowoff valve at said certain engine speed.

3,938,330

EXHAUST MANIFOLD WITH SLUICE VALVE

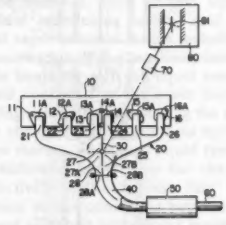
Yasuo Nakajima, Yokosuka; Yoshimasa Hayashi, Yokohama, and Tadahiro Yamamoto, Yokosuka, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed July 17, 1974, Ser. No. 489,110

Claims priority, application Japan, July 18, 1973, 48-81854

Int. Cl.[2] F02B *75/10*

U.S. Cl. 60—294 **3 Claims**



1. In an exhaust system of a motor vehicle which has an internal combustion engine of the straight-type six or more cylinders, the engine having a carburetor with an induction passageway, the system having an exhaust manifold and means arranged downstream of the exhaust manifold for converting unburned hydrocarbons and carbon monoxide contained in the exhaust gas of the engine into harmless substances before emission into the atmosphere, said exhaust manifold having at least six inlet branches each communicating respectively with each of the engine cylinders, the inlet branches being arranged generally in lateral alignment and divided into two adjoining groups of equal number, and an exhaust outlet communicating with said means, said outlet being divided into two passageways communicating with the two groups of inlet branches, respectively, the firing sequence of the engine being such that each cylinder communicating with the inlet branch of one group is fired alternately to each cylinder communicating with the inlet branch of the other group, the improvement comprising: the exhaust manifold defining a central space between all the inlet branches and the two passageways in such an arrangement that all the inlet branches communicate with the outlet through said space; the exhaust manifold further having a sluice valve rotatably disposed within said space such that said sluice valve normally occupies a position to partition said space into two half sections each communicating with one of the two groups of inlet branches and one of the two passageways, the exhaust system further having moving means selectively operable to move said sluice valve to another position wherein said two groups of inlet branches communicate with each other and with both of the two passageways, and control means detecting the engine speed and operating the moving means when the engine speed falls below a predetermined value.

3,938,331

HYDROSTATIC SERVOMECHANISM WITH ARTIFICIAL FEEDBACK

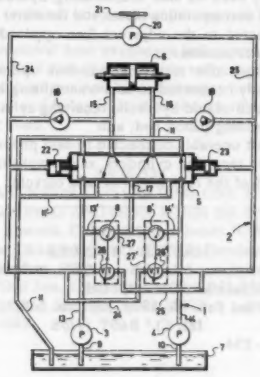
Bohumil Polacek, Brno, Czechoslovakia, and Semen Marsan, Moscow, U.S.S.R., assignors to Zavody tazkeho strojarstva, generalne riaditelstvo, Martin, Martin, Czechoslovakia

Filed Aug. 20, 1974, Ser. No. 498,918

Claims priority, application Czechoslovakia, Aug. 20, 1973, 5831-73

Int. Cl.[2] F15B *9/02, 13/16*

U.S. Cl. 60—385 **7 Claims**



1. In a hydrostatic servomechanism adapted for controlling the direction of vehicles and selfpropelled machines, said servomechanism including a power circuit comprising at least one servopump, at least one servomotor, a distributor and connecting piping and a control circuit comprising a measuring pump actuated by a command element, the control circuit having control branches, and reset mechanism for the distributor, the servomechanism being connected by the control branches to the reset mechanism of the distributor, the improvement which comprises at least one feedback simulator, the feedback simulator comprising a flow meter, a power circuit, and a controllable throttle means mechanically connected to the flow meter, the feedback simulator being incorporated between the control branches of the control circuit.

3,938,332

HYDRAULIC COUPLING MECHANISM

Rafael Tuti Roces, 1846-C F. Agoncillo St., Ermita, Manila, Philippines

Filed Apr. 29, 1974, Ser. No. 465,098

Claims priority, application Philippines, Dec. 27, 1973, 15360

Int. Cl.[2] F15B *7/02*

U.S. Cl. 60—536 **1 Claim**

1. A hydraulic coupling mechanism for bicycles comprising: at least a pair of opposed spaced apart channel members; a rectangular member having a pair of opposed sides which are disposed slidably along said opposed channel members and a pair of opposed free sides, said rectangular

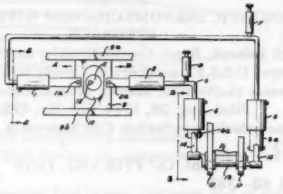
member having a generally elliptical opening at the middle thereof;

a drive shaft disposed normally through said elliptical opening in said rectangular member;

means for rotating said drive shaft;

a cam disposed eccentrically on said drive shaft and within said elliptical opening to reciprocate said rectangular member upon rotation of said shaft;

a pair of transmitting hydraulic cylinders disposed in close proximity to the opposed free sides of said rectangular



member, each of siad transmitting hydraulic cylinders having a corresponding piston rod the outer end of which is connected to the adjacent free opposed side of said rectangular member;

a pair of hydraulic receiving cylinders operably and synchronously connected to said transmitting hydraulic cylinders each of said hydraulic receiving cylinders having a corresponding piston rod; and

a crankshaft operably connected to said piston rods of said hydraulic receiving cylinders, said crankshaft serving as the shaft of the rear wheel of said bicycle.

3,938,333

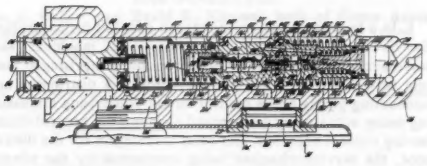
MASTER CYLINDER

Thomas P. Mathues, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 10, 1975, Ser. No. 548,356

Int. Cl.[2] B60T *11/08*

U.S. Cl. 60—574 **4 Claims**



1. A master cylinder assembly comprising:

a housing having reservoir chamber means and a fluid pressurization bore communicating with said reservoir chamber means, said bore having an open end and a closed end;

fluid pressurizing means reciprocably received in said bore and including a primary piston assembly and a secondary piston assembly in tandem relation, said assemblies each including a pressurizing piston and defining in said bore a primary fluid pressurizing chamber between said pressurizing pistons and a secondary pressurizing chamber on the opposite side of said secondary pressurizing piston from said primary fluid pressurizing chamber and toward said bore closed end, each of said fluid pressurizing chambers having an outlet for delivering pressurized fluid to brakes to be actuated, said secondary pressurizing piston having a bore extending axially therethrough;

a fluid pressure proportioner assembly mounted in said last named bore fluidly intermediate said secondary fluid pressurizing chamber and its outlet and responsive to fluid pressure generated in said secondary fluid pressurizing chamber and fluid pressure at said secondary fluid pressurizing chamber outlet to proportion fluid pressure at a predetermined pressure ratio from said secondary fluid pressurizing chamber to its outlet above a predetermined pressure at said secondary pressurizing chamber outlet;

and a shuttle piston assembly reciprocably mounted in said secondary pressurizing piston bore and having opposed areas respectively responsive to fluid pressure generated in said primary and secondary fluid pressurizing chambers and acting upon a predetermined relative pressure loss in said primary fluid pressurizing chamber to move toward said primary fluid pressurizing chamber and open said proportioner assembly to render the same inoperative to proportion fluid pressure and to permit fluid pressure generated in said secondary fluid pressurizing chamber to be delivered to its outlet without being proportionally modified by said proportioner assembly.

3,938,334

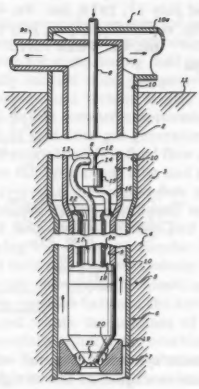
GEOTHERMAL ENERGY CONTROL SYSTEM AND METHOD

Hugh B. Matthews, Acton, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 10, 1974, Ser. No. 487,405

Int. Cl.[2] F03G *7/00*; F01K *23/00*

U.S. Cl. 60—641 **4 Claims**



1. In geothermal deep well pump apparatus of the kind including pump means for pumping a first fluid always in liquid state for flow in cooperative energy exchanging relation with respect to a second fluid:

first, second, and third conduit means respectively for transmission of said first and second fluids and a third fluid and having first common wall means between said first and second conduit means and second common wall means between said second and third conduit means,

said first and second common wall means being disposed one within the other in substantially vertical concentric relation,

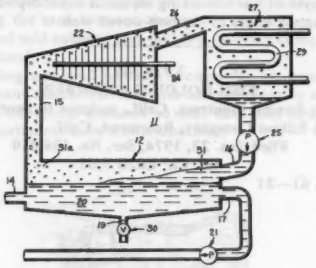
said first fluid being hotter than said second fluid and said second fluid being hotter than said third fluid, and

deflector means within said second conduit means for urging said second fluid into effecient proximate thermal energy exchange relation with said first common wall means and away from said second common wall means.

3,938,335
HEAT ENGINES

Edward F. Marwick, 5149 W. Morse Ave., Skokie, Ill. 60076

Filed July 30, 1973, Ser. No. 383,828
Int. Cl.² F01K 25/00; F04B 17/00
U.S. Cl. 60—673 10 Claims



1. A heat engine comprising a reaction chamber having an upper portion and a lower portion separated by float means, a substantially non-volatile liquid and a volatile working fluid substantially chemically non-reactive with the non-volatile liquid in the upper portion, liquid introducing means for transporting the non-volatile liquid from a source of heat to the reaction chamber, fluid introducing means for introducing the volatile working fluid into the reaction chamber in direct physical contact with the non-volatile liquid for conversion of the volatile working fluid into a vapor, vapor removal means for removing the vapor from the chamber, liquid removal means connected to reservoir means physically elevated with respect to the reaction chamber for removing the non-volatile liquid from the chamber, each of said liquid introducing means, said fluid introducing means, said liquid removal means and said vapor removal means including valve means to control pressurization of the reaction chamber for forcing the non-volatile liquid through the liquid removal means, an additional liquid contained in the lower portion, additional liquid introducing means for transporting the additional liquid to the reaction chamber and valve means for selectively controlling the flow therein, additional liquid removal means for removing the additional liquid from the chamber and valve means for selectively controlling the flow therefrom, and energy conversion means connected between said vapor removal means and said fluid introducing means for utilization of heat energy from said vapor.

3,938,336
TURBINE WITH HEATING AND COOLING

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 408,381, Oct. 23, 1973, Pat. No. 3,834,179. This application Feb. 28, 1974, Ser. No. 446,692
Int. Cl.² F01K 25/02; F25B 3/00
U.S. Cl. 60—682 1 Claim

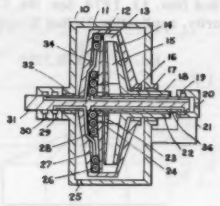
1. An improvement in a turbine for generating power, said turbine comprising:

a. a casing for supporting rotor shafts;

b. shafts journalled in bearings in said casing for rotation;

c. a rotating first rotor mounted on a shaft so as to rotate therewith, said first rotor being of circular configuration, and having an entry port for a first fluid near the center of said first rotor and having a radially outwardly extending passageway for said first fluid for effecting acceleration and centrifugal compression of said first fluid; said radially extending passageway being provided with a heat exchanger for adding heat to said first fluid during and after compression; said radially extending passageway being provided with a set of nozzles at its downstream end for passing said first fluid with said nozzles oriented to discharge said first fluid in forwardly tangential direction;

d. a rotating second rotor mounted on a shaft so as to rotate therewith; said second rotor having an entry for said first fluid adjacent to said first rotor nozzles for receiving said first fluid, with inward extending first fluid passageway for expansion of said first fluid and for receiving by said rotor the work associated with deceleration of said first fluid;



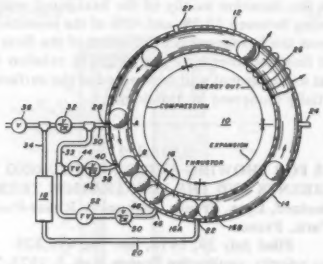
said second rotor having an exit port for said first fluid near the center of said rotor for passing said first fluid into said first rotor;

e. a heat removal heat exchanger being provided to cool said first fluid before and during early part of compression, said heat removal heat exchanger being within said first rotor and being in heat exchange relationship with said first fluid.

3,938,337
APPARATUS FOR CONVERTING ONE FORM OF ENERGY INTO ANOTHER FORM OF ENERGY

Sherwood L. Fawcett, Columbus, and James N. Anno, Cincinnati, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 17, 1975, Ser. No. 541,788
Int. Cl.² F01K 25/02
U.S. Cl. 60—682 8 Claims



1. Apparatus for converting a first form of energy to a second form of energy comprising:

a. a continuous loop passageway having a compressor section followed by a thrustor section,

b. a plurality of freely movable, unrestrained pistons disposed within said passageway for movement therearound,

c. a first conduit means connected to said compressor section for leading out compressed gas from said passageway as successive ones of the pistons move into the compressor section,

d. means for adding energy to the gas fed from the compressor section,

e. second conduit means for feeding gas, after the addition of energy thereto, back to the expander section to propel successive ones of said bodies around the passageway by expansion of the gas, and

f. means for regulating the pressure in said passageway between the connections thereto of said first and second conduit means.

3,938,338

COVERING OR BLANKETING LIQUID SURFACES AND FLOAT MEMBERS FOR EFFECTING SAME

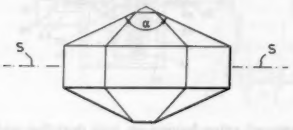
Arthur Prosper Cullen, 1 Cavendish Drive, Claygate, Surrey, England

Filed Nov. 11, 1974, Ser. No. 522,783

Claims priority, application United Kingdom, Nov. 9, 1973, 52177/73

Int. Cl.² E02B *3/00*

U.S. Cl. 61—1 R **16 Claims**



1. A float member, for side-by-side nesting relationship with similar float members for substantially completely blanketing or covering the surface of a liquid for reducing evaporation loss of the liquid and for reducing transfer of thermal energy between the liquid and atmosphere, the member comprising a body having a peripheral wall at its midportion of hexagonal shape and having a maximum transverse dimension of about 4.0 inches and a depth of at least about 0.2 inches, and wherein the hexagonal wall is located between opposed integral elements each of identical protuberant shape, the protuberance in each element terminating in the hexagonal wall and tapering inwardly away therefrom such that each protuberance presents sloping sides terminating at the wall, the sloping sides defining an angle to the horizontal of less than about 45° so that wind blowing across the member tends to urge it downwardly, and wherein the depth of the hexagonal wall is at least one-eighth of the total thickness of the float member measured in the direction axially of the hexagonal wall and said depth being between 12.5% and 40% of the maximum dimension across the hexagonal configuration of the float member, and said float member having a weight in relation to its size such that its hexagonal wall is disposed at the surface level of, and partially immersed in, the liquid.

3,938,339

MEANS FOR SHOWING AND/OR DETOURING WATER CURRENTS AND THE PREPARATION THEREOF

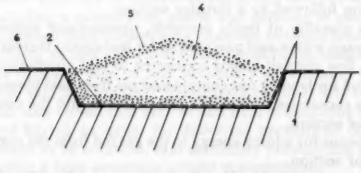
Yves Gaudard, Lyon, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed July 29, 1974, Ser. No. 492,825

Claims priority, application France, Aug. 3, 1973, 73.28757

Int. Cl.² E02B *3/02, 3/06*

U.S. Cl. 61—4 **8 Claims**



1. A jetty arranged angularly in relation to the edge of a body of water, to slow down and/or detour currents, comprising

a. a non-woven porous web of randomly arranged continuous filaments lining an excavation and having edges extended beyond the excavation,

b. a pile of fill in said excavation and extending upwardly therefrom to form a surface outside of the excavation,

c. said extended edges of said non-woven web being wrapped back against the outside surface of the pile to surround said pile of fill, and

d. a layer of wave-breaking elements superimposed on said wrapped edges of the non-woven web.

3,938,340

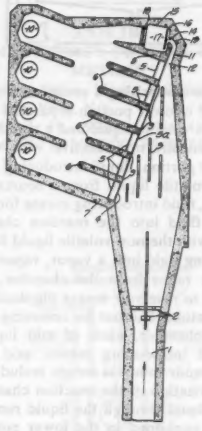
FISH HOLDING CHAMBER

Dallas I. Downs, Montrose, Calif., assignor to Southern California Edison Company, Rosemead, Calif.

Filed Jan. 23, 1974, Ser. No. 436,010

Int. Cl.² E02B *8/08*

U.S. Cl. 61—21 **17 Claims**



1. A fish holding chamber comprising:

an enclosure through which water normally flows substantially in the horizontal direction having a pair of side walls and a back wall, said back wall being partially defined by normally open water removal through which water exits the chamber;

means for creating substantially equal horizontal currents of water flowing along each of said side walls and substantially equal but opposite horizontal currents of water flowing across said back wall, said latter currents being strong relative to the horizontal flow of water through said water removal means; and

a relatively quiet water area substantially free of constant horizontal water currents in said enclosure, said area being defined by said currents.

3,938,341

STORAGE DEVICE FOR LIQUIDS

Theodorus Prins, Rivierdijk 655, Sliedrecht, Netherlands

Filed June 28, 1972, Ser. No. 267,037

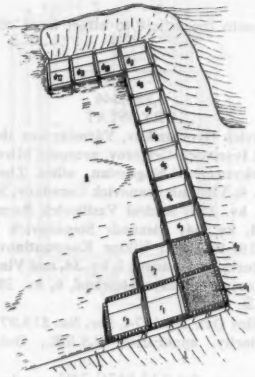
Claims priority, application Netherlands, Aug. 5, 1971, 7110804

Int. Cl.² B65G *5/00*; E02B *3/04*; E02D *5/00*

U.S. Cl. 61—46 **5 Claims**

1. A method of manufacturing out of a plurality of caissons an installation for storing petroleum products or the like in a water mass near a shore, each caisson comprising a pair of vertically upstanding horizontally spaced walls with a plurality of cross members therebetween, said method comprising the steps of:

a. levelling a bottom surface of a water mass at a predetermined depth to form a level surface;
b. arranging four of said caissons in edge to edge relationship, adjacent caissons perpendicular to each other, on said levelled surface;
c. interconnecting said four caissons at upright edges thereof both above and below the water surface to form a first box-like rectangular or square compartment;
d. filling the area between the spaced upstanding walls of each of said caissons and said first box-like compartment with sand;
e. building a second box-like rectangular or square compartment attached to said first compartment by means of three additional caissons so that said first and second compartments have a common wall;



f. filling the spaces between the upstanding walls of each of said additional caissons and said second compartment with sand;
g. repeating steps (a) – (f) until a dam wall extending generally parallel to said shore is completed;
h. repeating steps (a) – (f) until two rectangular side walls are formed extending a predetermined distance from said dam wall toward the shore so that a U-shaped storage region is formed; and
i. erecting a plurality of box-like rectangular or square storage compartments within said storage region by arranging a plurality of caissons on a levelled bottom surface of said storage region in edge to edge relationship, having common caisson-walls with said dam wall and said side walls and with each other, and filling with sand the area between the spaced upstanding walls of each of said caissons.

3,938,342

METHOD AND A DEVICE FOR BUILDING IMMERSED FOUNDATIONS

Jean Aubert, 8 rue la Boetie, Paris 8, (Seine), France

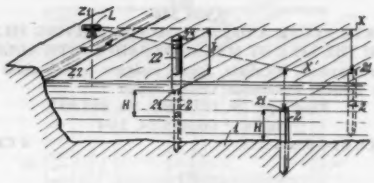
Filed June 4, 1973, Ser. No. 366,354The portion of the term of this patent subsequent to Mar. 13, 1990, has been disclaimed.

Int. Cl.² E02B *3/06, 7/00*

U.S. Cl. 61—46 **17 Claims**

1. A method for building immersed foundations on a prepared bed without preliminary unwatering by means of a platform which has on its underface downwardly extending anchoring means and which serves as a cover for the concrete employed in the construction of the foundation and which defines a seating surface for the final structure, comprising

positioning in the underwater bed a support constituted by at least three bearing points which project from said bed;
adjusting the height of the bearing points as a function of the depth selected for the seating plane;
lowering said platform underwater so as to rest on the bearing points;
enclosing the space between the foundation bed and the platform;



pouring a plastic material which is capable of setting and hardening into the said enclosed space in sufficient quantity to ensure that said platform anchoring means are imprisoned therein, without reaching the underface of the platform;
and then, after a sufficient time for the plastic material to set and harden, so that it constitutes with the platform a rigid and leaktight hollow body, filling the said hollow body with material in the plastic state, capable of setting and hardening.

3,938,343

PLATFORM STRUCTURE FOR MARITIME INSTALLATION

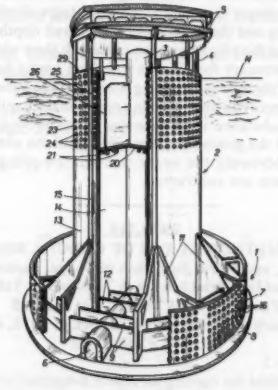
Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to C. G. Doris, Paris, France

Filed Nov. 5, 1974, Ser. No. 521,075

Claims priority, application France, Nov. 13, 1973, 73.40272; May 20, 1974, 74.17478

Int. Cl.² E02B *17/00, 3/04*

U.S. Cl. 61—46.5 **21 Claims**



1. An off-shore gravity-type platform for supporting a processing installation above the surface of a body of water and for housing processing components, comprising a base structure resting upon the bed of the body of water, a tower structure integrally connected to the base structure to be supported by the same and extending therefrom up to above said water surface, a deck supported on the upper end of the tower structure for supporting the processing installation, a pressure-resisting watertight hollow shaft having an open bottom

end open, incorporated within the tower structure and extending from the base structure to the deck for housing said components, a pressure-resisting watertight tubular skirt having both ends open, received telescopically in the shaft, and means for driving the tubular skirt pile-like into the bed of the body of water through said wide open bottom end, to give access to an underwater layer of said bed through said shaft and said tubular skirt.

3,938,344

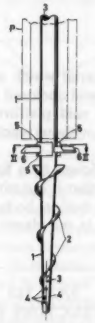
EARTH AUGER AND METHOD FOR DRIVING PILES AND THE LIKE BY MEANS OF SAID EARTH AUGER

Kingo Asayama, Hirakata, Japan, assignor to Kabushiki Kaisha Takechi Koumusho, Osaka, Japan

Filed Apr. 29, 1974, Ser. No. 465,091

Int. Cl.² E02D 5/34, 5/74

U.S. Cl. 61—53.66 **4 Claims**



1. The method of setting and anchoring a tubular piling including the steps of placing the piling in the ground; inserting an auger having a ground formation boring head through the piling until the head is below the lower end of the piling; rotating the auger and expanding the diameter of the ground cutting elements to a diameter substantially greater than that of the piling and while the cutting elements are so expanded boring a hole larger than said piling and progressively lowering both the piling and the auger until the desired depth of ground penetration of the piling has been obtained; then while holding the piling stationary forming an enlarged cavity beneath the lower end of the piling, injecting a mortar-like substance into and filling the cavity and injecting additional quantities of the mortar-like substance in the annular space between the walls of the bore in the ground and the piling until the annular space is filled; withdrawing the auger through the piling while the cutter elements are contracted.

3,938,345

COOLING METHOD BY USE OF CORONA DISCHARGE

Joji Yamaga, and Morio Jido, both of Tokyo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

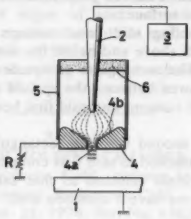
Filed Oct. 3, 1974, Ser. No. 511,725

Claims priority, application Japan, Oct. 6, 1973, 48-112559

Int. Cl.² F25B 21/02

U.S. Cl. 62—3 **2 Claims**

1. In a method for cooling an article subjected to cooling by utilizing corona discharge caused by placing the article opposite a high-potential electrode and applying high electric potential between the article and the electrode, the improvement which comprises interposing between the article and the high-potential electrode a corona focusing ring possessed of a central hole defining a centrally inclined upper face and applying high electric potential between said electrode and said corona focusing ring and the article subjected to cooling to generate corona discharge therebetween, whereby the avalanche of ions generated in consequence of the corona discharge is focused in the direction of the central hole by the inclined face of said corona focusing ring and released past the



central hole onto the article to effect local cooling of the article.

3,938,346

CRYOSTAT

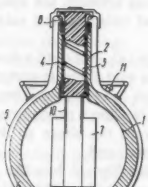
Viktor Sergeevich Ovchinnikov, Yaroslavskoe shosse, 28, kv. 16; Eduard Ivanovich Grigorov, prospekt Mira, 90, kv. 78; Arkady Lukyanovich Magdesian, ulitsa Zheleznodorozhnaya, 3, kv. 4; Vladimir Ivanovich Gorelikov, Serpukhovsky val, 19/43, kv. 184; Andrei Vasilievich Bermishev, ulitsa Grishina, 8, kv. 44; Alexandr Stepanovich Utkin, ulitsa Stroitelei, 10, kv. 285; Viktor Konstantinovich Fedotov, ulitsa Khalturina, 14, korpus 2, kv. 34, and Vladimir Yakovlevich Volkov, Arbatskaya ploschad, 6, kv. 39, all of Moscow, U.S.S.R.

Filed Oct. 18, 1974, Ser. No. 515,979

Claims priority, application U.S.S.R., Oct. 25, 1973, 1966792

Int. Cl.² F17C 7/02

U.S. Cl. 62—50 **8 Claims**



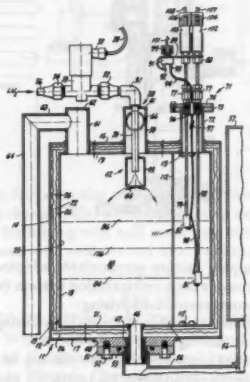
1. A cryostat comprising a thermally insulated vessel for storing cryogenic products including a neck, said vessel being made of a material with a heat conductivity not exceeding 0.35–0.4 W/m degree and a tensile strength of 10–20 kg/mm²; a non-metallic stopper having a solid cross-sectional area made of a material having a heat connductivity not exceeding 0.03–0.05 W/m degree and a tensile strength of 5–15 kg/mm², said stopper being tightly fitted into said neck of said thermally insulated vessel; a helical channel being formed between said stopper and the inner surface of said neck, said channel beginning at one end of said stopper and terminating at the other end thereof for removing vapor of the evaporating cryogenic products into the ambient atmosphere, the ratio of the length of said channel to the cross-sectional area being such that excessive vapor pressure of the evaporating cryogenic products in said vessel is eliminated, while the temperature of said vapor at the outlet of said neck corresponds to the temperature of the ambient atmosphere.

3,938,347

LEVEL CONTROL APPARATUS AND METHOD FOR CRYOGENIC LIQUIDS

Hans J. Riedel, Petaluma, and Vernon C. Spellman, Santa Rosa, both of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Apr. 12, 1974, Ser. No. 460,376
Int. Cl.² F17C 7/02
U.S. Cl. 62—55 7 Claims



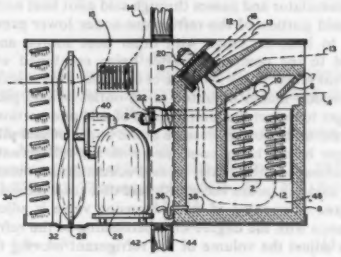
1. In a level control apparatus for a cryogenic liquid, a source of cryogenic liquid, an insulated flask having a chamber for holding a cryogenic liquid, inlet means mounted on the flask for introducing a cryogenic liquid into the chamber, outlet means mounted on the flask for permitting cryogenic liquid to be removed from the flask, first and second probe assemblies mounted in the flask and having their lower extremities at different elevations within the chamber which are adapted to be covered by the cryogenic liquid within the chamber, each of said probe means including thermocouple means for generating a voltage in response to temperature and heating means for generating heat and supplying the same to the thermocouple means whereby the thermocouple means produces a signal of one type when the heating means is in contact with the cryogenic liquid and a signal of a different type when at least a portion of the heating means is out of contact with the cryogenic liquid, and means responsive to the signals from said thermocouple means of the first and second probe assemblies for automatically controlling the flow of cryogenic liquid from said source into said inlet means, said means responsive to the signals from said thermocouple means in said first and second probe assemblies including a meter relay having upper and lower set points corresponding to two temperatures, one hot and one cold, with the hot temperature being reached when the heating means for both of said first and second probe assemblies are no longer covered by the cryogenic liquid and with the cold temperature being reached when the heating means for both of said first and second probe assemblies are substantially covered by said cryogenic liquid, solenoid operated valve means connected between the source and the inlet for controlling the flow of cryogenic liquid from said source to said inlet and relay means responsive to the meter relay for controlling operation of said solenoid operated valve means whereby filling of chamber with cryogenic liquid from said source is started when the upper set point is reached and continues until the lower set point is reached.

3,938,348

VENTILATING AND/OR COOLING DEHUMIDIFIER

Glenn E. Rickert, Community State Bank Bldg., Huntington, Ind. 46750

Filed Oct. 15, 1974, Ser. No. 514,501
Int. Cl.² F25D 17/06
U.S. Cl. 62—97 11 Claims



1. In a refrigeration system having a compressor, a condenser, and an evaporator connected in a series refrigerating circuit, the improvement for supplying fresh outside air to a space to gradually displace stale inside air, and to maintain the space near a desired temperature and near a desired relative humidity comprising:

a chamber containing the evaporator coil and having a fresh air inlet, a recirculating air inlet, and an air outlet;

means for substantially continuously supplying fresh outside air to the fresh air inlet whereby the fresh air may pass the evaporator coil, be cooled to condense excess moisture therefrom, and pass into the space through the air outlet; and

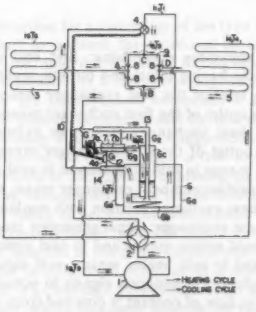
means for intermittently supplying space air to the recirculating air inlet so that the space air may pass the evaporator, be cooled, and pass back into the space through the air outlet to maintain the space near a desired temperature.

3,938,349

REFRIGERATING APPARATUS WITH SUPERHEAT CONTROL

Takeo Ueno, Sennan, Japan, assignor to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Sept. 5, 1974, Ser. No. 503,507
Claims priority, application Japan, Sept. 21, 1973, 48-107206; Sept. 21, 1973, 48-107207
Int. Cl.² F25B 13/00
U.S. Cl. 62—197 12 Claims



1. A refrigerating apparatus comprising a refrigeration circuit in which a compressor, an outdoor heat exchanger, a

receiver, a temperature sensing automatic expansion valve, a room heat exchanger and an accumulator are connected together in the indicated order, said receiver and said accumulator being capable of performing heat exchange; a pilot heat exchanger disposed in parallel with said accumulator and connected to said refrigeration circuit such that a portion of a refrigerant under lower pressure disposed at an outlet of said room heat exchanger functioning as an evaporator bypasses said accumulator and passes through said pilot heat exchanger where said portion of the refrigerant under lower pressure is subject to heat exchange with other heat source and then returned to the compressor after being combined with the refrigerant under lower pressure at an outlet of said accumulator; detection means mounted at an outlet of said pilot heat exchanger to detect the temperature of said one portion of the refrigerant under lower pressure at the outlet of said pilot heat exchanger before being combined with the refrigerant under lower pressure at the outlet of said accumulator, means connecting said expansion valve with said detection means so that the degree of opening of said expansion valve is adjusted in accordance with the degree of superheating of the refrigerant so as to adjust the volume of the refrigerant moving through the refrigeration circuit, whereby the room heat exchanger can be made to operate in humid condition at all times regardless of changes in the load and the humid refrigerant can be subjected to heat exchange with a refrigerant under higher pressure in said accumulator so as to return to said compressor of a refrigerant in a saturated gaseous state.

3,938,350

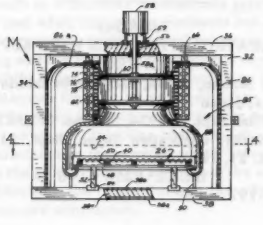
FREEZE TUNNEL

Patrick S. Martin, and Barron M. Moody, both of Dallas, Tex., assignors to Cryogenics Corporation of America, Dallas, Tex.

Continuation-in-part of Ser. No. 250,616, May 5, 1972, Pat. No. 3,802,212. This application Dec. 10, 1973, Ser. No. 423,333

Int. Cl.[2] F25D *21/06*

U.S. Cl. 62—156 **11 Claims**



1. Freezer apparatus comprising: first and second heat exchanger means having inlets and outlets; means to deliver coolant to the inlet of the first exchanger means; a conduit connecting the outlet of the first exchanger means to the inlet of the second heat exchanger means; an exhaust line connected to the outlet of the first exchanger means; signal responsive valve means in said conduit and in said exhaust line; means to heat said second heat exchanger mean; sensor means positioned in heat exchange relation with coolant discharged from second heat exchanger; signal generator means operably connected to said sensor means and to said signal responsive valve means and to said heater means, said signal generator means being adapted to generate signals to actuate said valve means such that flow of coolant is diverted from the first heat exchanger to the exhaust line and the heater means is energized when temperature of coolant exhausted from said second heat exchanger is less than a predetermined temperature.

3,938,351

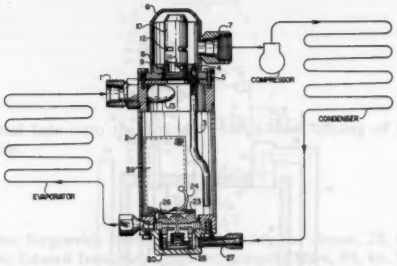
COMBINATION LIQUID TRAPPING SUCTION ACCUMULATOR AND EVAPORATOR PRESSURE REGULATOR DEVICE INCLUDING A CARTRIDGE TYPE EXPANSION VALVE

Ernest W. Schumacher, Portsmouth, Va., assignor to Virginia Chemicals, Inc., Portsmouth, Va.

Division of Ser. No. 388,281, Aug. 14, 1973, Pat. No. 3,858,407. This application Oct. 30, 1974, Ser. No. 519,304

Int. Cl.[2] F25B *41/04*, *43/00*

U.S. Cl. 62—217 **3 Claims**



1. A liquid trapping suction accumulator adapted for insertion in a vapor-compression refrigeration system between the evaporator and compressor comprising:

A. an accumulator chamber defined by a casing vertically extending and having a top and a bottom;

B. inlet and outlet ports opening into the top of said chamber and respectively adapted for operative connection to said evaporator and said compressor;

C. an evaporator pressure regulator chamber interposed between said inlet and outlet ports in communication with said accumulator chamber, said chamber including:

i. a pressure responsive evaporator pressure regulator device, vertically positioned in said evaporator pressure chamber proximate said outlet port so as to gauge admission of vapor from said accumulator chamber into said evaporator pressure regulator chamber and through said outlet;

D. an eductor tube vertically extending independently from the bottom of said accumulator chamber into said evaporator pressure regulator chamber;

E. a cartridge type expansion valve assembly mounted within the bottom of said accumulator chamber said assembly having an entrance port connected to the condenser in said system with said cartridge type expansion valve mounted within and proximate the bottom of said accumulator casing and including an equalizing port for direct communication between said accumulator bottom and said expansion valve; a wire mesh strainer located in said entrance port and a desiccant bag supported within said accumulator chamber adjacent said expansion valve.

3,938,352

WATER TO AIR HEAT PUMP EMPLOYING AN ENERGY AND CONDENSATE CONSERVATION SYSTEM

A. Carl Schmidt, Fort Lauderdale, Fla., assignor to Weil-McLain Company, Inc., Dallas, Tex.

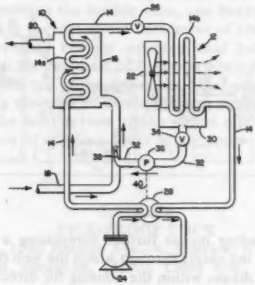
Filed July 10, 1974, Ser. No. 487,251

Int. Cl.[2] F25D *47/00*

U.S. Cl. 62—279 **14 Claims**

1. A water to air heat pump comprising a first heat exchanger including a coil and means for passing air over said coil; a second heat exchanger including a coil and a jacket enclosing said coil, said jacket having an inlet for receiving water from an external source and an outlet for discharging said water back to said source, said water being continuously circulated through said jacket and over said coil; conduit

means for circulating a heat exchange fluid between said coils, said first heat exchanger adapted to act as an evaporator and evaporate said fluid and cool said air, and said second heat exchanger adapted to act as a condenser and condense said



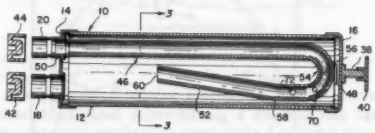
fluid; means for collecting the condensate from said air at said first heat exchanger; and means for passing said condensate to said jacket for mixing with said water and circulating over the coil associated with said second heat exchanger.

3,938,353

LIQUID TRAPPING SUCTION ACCUMULATOR

George T. Wrenn, Jr., Crittenden; Hugh W. Mann, Portsmouth, and Krishna R. K. Sarma, Chesapeake, all of Va., assignors to Virginia Chemicals, Inc., Portsmouth, Va.

Continuation-in-part of Ser. No. 359,569, May 11, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,106
Int. Cl.[2] F25B *43/00*
U.S. Cl. 62—503 4 Claims



1. A liquid trapping suction accumulator adapted for insertion in a vapor-compression refrigeration system between the evaporator and compressor, comprising:

A. an accumulator chamber defined by a casing having a top and a bottom;

B. inlet and outlet ports in said opening into said chamber and respectively adapted for operative connection to said evaporator and said compressor; and

C. an outlet connector mounted in said outlet port;

D. a J-shaped tube mounted within said casing; and

i. the long leg thereof extending into and terminating in said outlet connector centrally positioned within and in peripherally spaced relationship from the internal surface of said outlet port;

ii. inwardly extending dimples spacedly positioned about the inner periphery of said outlet connector and providing an interference fit with the outer diameter of said J-tube outlet end for rigid support thereof in said connector, the spacing between the dimples creating a predetermined open area therebetween for exiting gas;

iii. the outlet end of said J-tube being outwardly flared to a controlled diameter for coacting with said dimples in an interference fit therewith; and

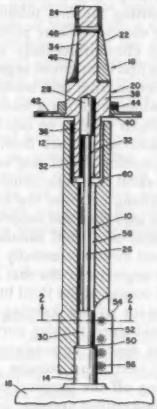
iv. a short inlet leg thereof extending a substantial distance above the chamber bottom, and said short leg having a bend therein angularly displacing the inlet opening from direct vertical alignment with said inlet port, wherein the distal end of said short leg extends above the vertical midpoint of said accumulator chamber, distal short leg further including a liquid feedback port at the bend of said J-tube with a plurality of additional liquid feedback orifices of increasing diameter in said short leg, said orifices being of increasing diameter towards said distal end.

3,938,354

APPARATUS FOR TRANSMITTING ROTATIONAL ENERGY FROM A MOTOR TO THE ROTOR OF A CENTRIFUGE

Ivan L. Lehman, Contoocook, N.H., assignor to Damon Corporation, Needham Heights, Mass.

Continuation-in-part of Ser. No. 201,069, Nov. 22, 1971, Pat. No. 3,779,451. This application Mar. 20, 1973, Ser. No. 343,042
Int. Cl. F16c *1/00*
U.S. Cl. 64—1 V 11 Claims

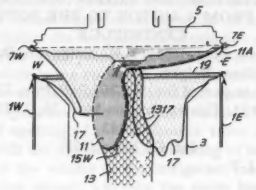


1. A construction for a centrifuge of the type which includes a flexible shaft to transmit the rotational motion of a motor shaft to a rotor, said flexible shaft having upper and lower connectors separated by a relatively long, thin central member, wherein the improvement comprises a shaft protector enclosing the central member of said flexible shaft, said shaft protector defining a lumen of a configuration such that the central member of the flexible shaft is free to flex within the lumen but which is sufficiently confining so as to prevent bending of the central member of the flexible shaft to a point which would result in permanent deformation of the flexible shaft, and a rotor adapter with the upper connector of the flexible shaft inserted in the rotor adaptor and the lower connector of the flexible shaft coupled to a motor shaft, and wherein there is a clearance between the rotor adapter and the shaft protector, which clearance governs the radial movement of the rotor adapter relative to the axis of rotation of the motor shaft and prevents the shaft from breaking due to a mechanical stress on the rotor.

3,938,355
METHOD OF KNITTING A PLURALITY OF CONVERGENT TUBULAR PORTIONS AND RESULTING ARTICLE

Paolo Conti, Florence, Italy, assignor to Billi, S.p.A., Florence, Italy

Filed Aug. 10, 1973, Ser. No. 387,515
Claims priority, application Italy, Aug. 12, 1972, 9641/72; Nov. 16, 1972, 9758/72
Int. Cl.² D04B 9/42; A41B 9/00
U.S. Cl. 66—95 12 Claims



1. A process of knitting on a circular knitting machine having a needle cylinder and a dial plate with hooks, said method comprising the steps of knitting a first tubular portion on first selected needles spaced circumferentially around the needle cylinder, projecting the dial hooks to receive the first tubular portion, supporting the first tubular portion on said dial hooks, knitting a second tubular portion on second selected needles spaced circumferentially around the needle cylinder, transferring a first continuous segment of the stitches of said first tubular portion from said hooks to corresponding ones of said needles while retaining a second segment of the stitches of said first tubular portion on said hooks, joining said first segment of transferred stitches from said first tubular portion to the corresponding arc of said second tubular portion, knitting an anti-ravel tab conextensive with the arc of said first segment, pressing off from the knitting needles the anti-ravel tab between said first and second tubular portions, knitting an initial course of a third tubular portion on third selected needles spaced circumferentially around the needle cylinder, projecting a segment of the dial hooks to receive a segment of said initial course of the third tubular portion from a corresponding segment of the knitting needles and then continuing knitting said third tubular portion on all of said third selected needles spaced circumferentially around the needle cylinder until said third tubular portion reaches a desired length, pressing off the terminal course of said third tubular portion on the knitting needles, transferring the segment of stitches in said initial course of the third tubular fabric from the dial hooks to a corresponding segment of the knitting needles, transferring said second segment of stitches of said first tubular portion from the dial hooks to a corresponding segment of said knitting needles, and knitting a fourth tubular portion on all of said knitting needles spaced circumferentially around the cylinder.

3,938,356
WEB FINISHING MACHINES

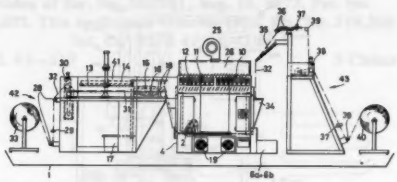
Hans F. Arendt, Bleichinsel, 712 Bietigheim, Wurttemberg, Germany

Filed Sept. 26, 1973, Ser. No. 400,911
Claims priority, application Germany, Sept. 27, 1972, 2247320
Int. Cl.² D06B 3/02, 21/00; C14C 15/00
U.S. Cl. 68—5 D 11 Claims

1. A machine for continuously finishing a web of material comprising the combination of

a casing, a drum mounted for rotation within the casing,

web feeding means for introducing the web into the drum, the web traveling continuously through the interior of the drum, web withdrawal means for withdrawing the web from the drum and casing, ventilating means fixed to the casing for removing air from and introducing fresh air to the drum and casing, steam spraying means fixed to the casing for spraying steam into the drum, a heater mounted within the casing and above the drum for directing heat and infrared radiation to the drum,

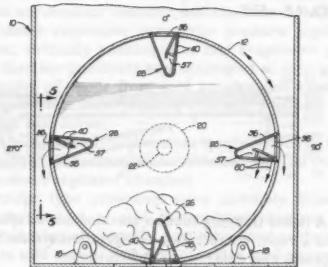


the web feeding means further comprising a housing attached to the casing through which the web travels, direct radiation means within the housing for directing infrared radiation onto the web, and moistening means within the housing and following the direct radiation means for moistening the web prior to its introduction into the drum.

3,938,357
CLEANING MACHINE UTILIZING NON-LIQUID CLEANING AGENTS

Joseph Leib, 4835 W. Jefferson Blvd., Los Angeles, Calif. 90016

Filed July 1, 1974, Ser. No. 484,816
Int. Cl.² C14B 15/00
U.S. Cl. 69—23 5 Claims



5. In a cleaning machine for use with powdered and/or granular cleaning agents:

a. a cleaning drum having a circular edge forming front air influent opening;

b. means supporting the cleaning drum for angular movement about a substantially horizontal axis;

c. means forming an enclosure for the drum, and having a frontal opening registering with and surrounded by said drum opening, the said circular edge of said drum located in close proximity to said enclosure to form a substantially sealed relationship thereto;

d. an access door for said enclosure opening, and itself having air passages therethrough for entry of air into the drum;

e. an air pump operable to exhaust air from said enclosure following a cleaning cycle;

f. a plurality of tumble vanes in the drum of generally triangular cross-sectional configuration, each tumble vane having surfaces on opposite sides, one of which is pro-

vided with an array of openings for entry of air into the tumble vane;

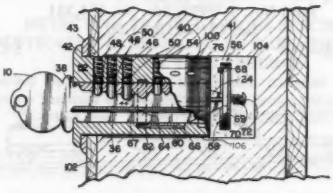
g. said drum having effluent openings at the periphery thereof and located at the bases of said tumble vanes for registry with the interior spaces thereof;

h. and a baffle plate for each tumble vane and located behind the array of openings to form a trap for cleaning agent entering the tumble vane, and having a distal edge located to prevent direct movement of cleaning agent to corresponding effluent opening; said baffle forming a trough at the periphery of the drum when the tumble vane is near the top of the drum, the distal edge of the baffle ensuring shuttling of cleaning agent across the openings inside the tumble vane upon rotation of the tumble vane for return of cleaning agent to the drum.

3,938,358
PICK-PROOF LOCK

David Doyle, 1768 Horatio Ave., N. Merrick, N.Y. 11566, and Murray M. Shtulman, 163-35 130th Ave., Jamaica, N.Y. 11434

Continuation-in-part of Ser. No. 199,984, Nov. 18, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,821
Int. Cl.² E05B 27/06
U.S. Cl. 70—358 **16 Claims**

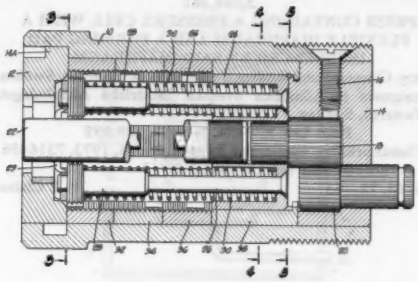


1. A key-operated locking mechanism for use in conventional latch-operated doors having a conventional cylinder plug housing said mechanism comprising a cylinder plug comprising said latch and having a keyway, a shell aligned with and adapted to receive and hold said cylinder plug, said cylinder plug and shell assembly adapted to fit within said conventional plug housing so as to be a replacement for a standard cylinder assembly, said cylinder plug being axially rotatable within said shell, a plurality of bores located in said shell, a plurality of bores located in said cylinder plug axially aligned with said bores in said shell, a plurality of sets of movable pin tumblers carried in said shell and cylinder plug bores connecting said shell to said cylinder plug and intersecting the clearance between said shell and cylinder plug, said pin tumblers blocking said axial rotation of said cylinder plug in said shell, said pin tumblers being movable within said bores by respective cuts in a key to clear said clearance between said shell and said cylinder plug and provide a shear line clearance permitting axial rotation of said cylinder plug within said shell, a latching means connected to said cylinder plug, coupling means coupling said axial rotational movement of said cylinder plug to operate said latching means, a plate, blocking pin means carried on said plate, a recess at the rear of said shell for receiving said blocking pin means, a pair of guide pins having one end respectively attached to the rear of said plug, spring members bearing against said plate and attached to said guide pins to force said blocking pin means into said recess, said plate being directly moved by the front end of the key to move said blocking pin out of engagement with said recess.

3,938,359
LOCK ASSEMBLY

James A. Millett, Fountain Valley, and James W. Raymond, Newport Beach, both of Calif., assignors to James W. Raymond, Calif.

Filed Aug. 19, 1974, Ser. No. 498,269
Int. Cl.² E05B 27/06
U.S. Cl. 70—363 **17 Claims**

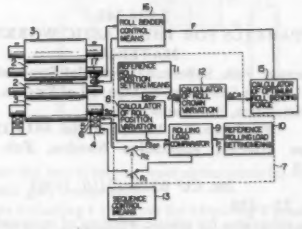


1. A lock assembly comprising: a cylindrical shaped outer casing; a plurality of annular logic members mounted in said casing tandem to one another coaxially with the central axis of the casing; an annular clutch member mounted in said casing adjacent to one end of the logic members and coaxial with the central axis of the casing; a drive shaft mounted in said casing and extending along the central axis thereof; a tumbler carrier keyed to said drive shaft and mounted on the end thereof in nested concentric relationship with respect to said annular clutch member; a plurality of elongated tumbler shafts mounted on said carrier and extending along respective axes radially spaced from the central axis of the casing and parallel thereto; a corresponding plurality of tumblers mounted on respective ones of said tumbler shafts to be moved axially along the respective axes to selected axially aligned positions with respect to the annular logic members; and resilient means biasing said tumblers toward the forward end of the casing.

3,938,360
SHAPE CONTROL METHOD AND SYSTEM FOR A ROLLING MILL

Shigeru Shida; Kenichi Yasuda; Hiroshi Awazuhara, all of Hitachi, and Sukebumi Tsumura, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 30, 1974, Ser. No. 465,577
Claims priority, application Japan, May 2, 1973, 48-48509; Nov. 21, 1973, 48-130232
Int. Cl.² B21B 37/08
U.S. Cl. 72—8 **11 Claims**


ROLL BENDER CONTROL MEANS
REFERENCE ROLL POSITION SETTING MEANS
CALCULATOR OF ROLL POSITION DEVIATION
CALCULATOR OF ROLL CROWN VARIATION
CALCULATOR OF OPTIMUM ROLL BENDING FORCE
ROLLING LOAD COMPARATOR
REFERENCE ROLLING LOAD SETTING MEANS
SEQUENCE CONTROL MEANS

1. A shape control system for use with a rolling mill, the system comprising means for detecting the rolling load and roll position, means for determining the variation roll position

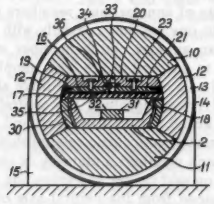
ΔS_o from the detected rolling load and roll position; means for calculating the roll crown variation ΔC_x from said variation ΔS_o in accordance with a preselected functional relation; and means for controlling the roll bending means in response to the output from means for said calculator.

3,938,361

PRESS CONTAINING A PRESSURE CELL WITH A FLEXIBLE DIAPHRAGM AND A FORMING PAD INFLUENCED BY SAID DIAPHRAGM

Harry Claesson, and Anders Traff, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 5, 1974, Ser. No. 529,892
Claims priority, application Sweden, Dec. 6, 1973, 7316456
Int. Cl.² B21D *22/12*
U.S. Cl. 72—63 **2 Claims**



1. Hydraulic press comprising a pressure cell with a diaphragm (18) of flexible material having an opening and an inwardly directed annular bead (19) around the opening, two disc-shaped attachment members (20,21) for the diaphragm which form between them a first annular groove fitting to the bead, and a pad of flexible material influenced by the pressure cell for forming plates which are placed on forming pieces in a working space below the pad, said two attachment members and the bead of the diaphragm together forming a second closed annular groove and at least one sealing ring (25) of elastic material arranged in said second groove.

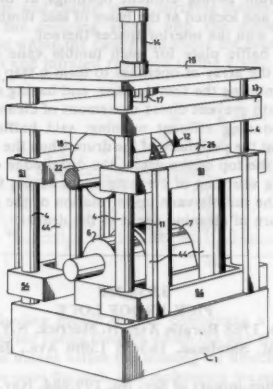
3,938,362

APPARATUS FOR THE PLASTIC WORKING OF MATERIAL

Curt Gunnar Falk, Sollentuna; Per-Olof Strandell, Taby, and Karl Lennart Sundberg, Spanga, all of Sweden, assignors to AB Metalform, Stockholm, Sweden

Filed Feb. 12, 1974, Ser. No. 441,819
Claims priority, application Sweden, Feb. 12, 1973, 7301951
Int. Cl.² B21B *13/10*, *31/02*
U.S. Cl. 72—225 **10 Claims**

1. An apparatus for plastic working of material, comprising in combination a lower portion carrying a lower working roll and upstanding bars; and upper portion in the form of a carriage mounted on the bars for gliding movement along said bars and carrying an upper working roll intended for co-action with the lower working roll; means for displacing the carriage along the bars; and expander sleeves surrounding the bars and carried by the carriage, the expander sleeves being actuable to



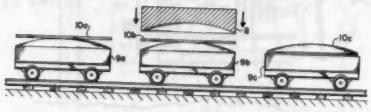
clamping engagement with the bars for fixing the carriage to the bars in an optional position of displacement.

3,938,363

FORMING METAL PLATE

Ronald A. Kelsey, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 9, 1973, Ser. No. 414,381
Int. Cl.² B21D *11/00*
U.S. Cl. 72—364 **5 Claims**



1. A metal forming method comprising the steps of heating a metal plate to a temperature below the temperature at which grain boundary melting occurs, placing the plate on a bottom die of temperature lower than plate temperature, lowering a top die of temperature lower than plate temperature onto the plate, the temperature of the plate when the top die first contacts it in the step of lowering being at least high enough to maintain springback at less than ⅛-inch in 25-feet if the plate were allowed after being formed to cool naturally between the dies to 125°F, the top die having sufficient weight such that the plate is deformed to conform to the dies in the step of lowering, the weight of the top die bearing on the plate, after it has conformed to the dies, with a pressure up to 100 pounds per square inch, leaving the plate between the dies until the plate time and temperature history following the lowering of the top die is such that a springback of less than ⅛-inch in 25-feet is experienced on opening the dies, and then opening the dies for removal of the plate.

3,938,364

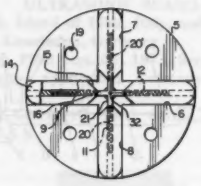
WRAPPING POST SWAGING APPARATUS

Phillip Anthony Ragard, Binghamton, and Keith Alan Young, Maine, both of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Aug. 13, 1974, Ser. No. 497,083
Int. Cl.² B21J *17/16*
U.S. Cl. 72—403 **6 Claims**

1. An apparatus for producing a continuous length of wrapping post material having a series of equally spaced weakened portions therealong, said apparatus comprising a work holding means having an aperture for receiving a length of said mate-

rial, a plurality of sets of swaging means slidably mounted to said holding means for forming said equally spaced weakened portions on said material, said swaging means are equally spaced about said aperture, a pressure means rotatably mounted to said holding means for sequentially operating said plurality of sets of swaging means to deform said material one



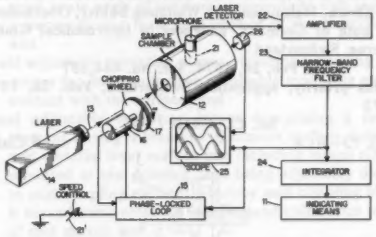
set at a time, said pressure means includes a plurality of sets of camming means corresponding to said plurality of sets of swaging means wherein members of said sets of camming means are equally spaced about said aperture and said sets of camming means are unequally spaced relative to each other about said aperture to produce a sequential operation of said sets of swaging means.

3,938,365

DETECTING TRACE GASEOUS SPECIES ACOUSTICALLY IN RESPONSE TO RADIATION FROM AN INTENSE LIGHT SOURCE

C. Forbes Dewey, Jr., Belmont, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 29, 1973, Ser. No. 420,130
Int. Cl.[2] G01N *29/02*
U.S. Cl. 73—24 16 Claims



1. Apparatus for detecting the presence of a species in a medium comprising,

means defining a sample chamber for receiving said medium,

a source of a beam of radiant energy incident upon said sample chamber for producing pressure waves therein of intensity related to the degree of absorption by said medium,

means modulating said beam at a rate corresponding to a predetermined resonant frequency of said means defining a sample chamber,

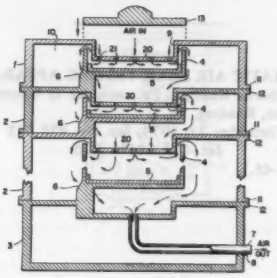
and acoustical detecting means for detecting the pressure wave signals produces in said sample chamber to provide an output signal representative of the degree of absorption of the medium in said sample chamber.

3,938,366

AEROSOL ANALYZER

Paul Terence Wertlake, Los Angeles, Calif., and James Steele Harrison, Ringwood, N.J., assignors to Applied Bioscience, Fairfield, N.J.

Filed Oct. 29, 1974, Ser. No. 518,229
Int. Cl.[2] G01N *15/06*
U.S. Cl. 73—28 6 Claims



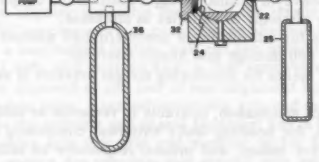
1. Apparatus for separating particles from a fluid, comprising a housing, means for flowing a fluid through said housing, a plurality of parallel perforated plates supported in said housing spaced from one another in the direction of fluid flow, the perforations of each plate being of the same size with the number of perforations per plate being fewer in the direction of fluid flow, sample-holding means immediately downstream of each perforated plate, and conduit means for establishing a path of fluid flow through each said plate onto its associated sample-holding means and thence around said sample-holding means to the next downstream plate, said inner wall of said housing being spaced from said path at least sufficient to substantially avoid contact with fluid flowing along said path.

3,938,367

SAMPLER OF GAS BORNE PARTICLES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Charles G. Miller, Pasadena, and James B. Stephens, La Crescenta, both of Calif.

Filed Mar. 28, 1975, Ser. No. 563,283
Int. Cl.[2] G01N *15/00*
U.S. Cl. 73—28 10 Claims



1. A system for extracting at least some particles borne in a gas from said gas, comprising:

valve means including a chamber for receiving a preselected amount of gas containing particles in said chamber;

filter means disposed at one end of said chamber and including a single filter element with straight-through holes of preselected diameters; and

drive means for establishing a pressure differential across said filter element which is just below the rupture pres-

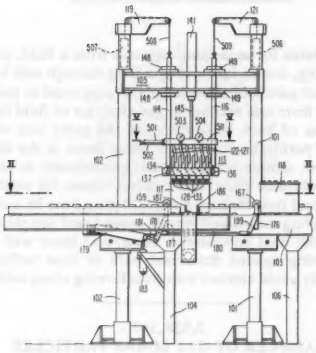
sure of said filter element and including a carrier gas of low molecular weight in communication with said chamber for forcing said gas containing said particles through the holes of said filter element at a velocity, whereby particles of dimensions less than the holes' diameters become separated from the gas, as the latter's stream line changes direction to pass through the holes, with the separated particles being bound to an exposed surface of the filter element.

3,938,368

AUTOMATIC AIR LEAK TESTING APPARATUS

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed May 31, 1974, Ser. No. 475,273
Int. Cl.² G01M *3/26*
U.S. Cl. 73—45.1 **8 Claims**



1. Automatic leak testing apparatus for battery cells comprising:

a. a nozzle assembly movable to mate with at least one cell outlet of a battery;

b. means for periodically coupling and decoupling said nozzle assembly from said battery;

c. first conveyor means having a position for coupling said nozzle assembly to batteries as aforesaid;

d. means for introducing a predetermined amount of gas into a cell through said nozzle assembly;

e. meter means for monitoring the gas pressure in said cell; and

f. a reject mechanism, operable in response to said meter means, for isolating leaky batteries, comprising second conveyor means, and means, responsive to said meter means, for removing leaky batteries from said first conveyor means, and transferring said leaky batteries to said second conveyor means, said means for removing comprising:

i. continuous cable means between said first and second conveyor means; and

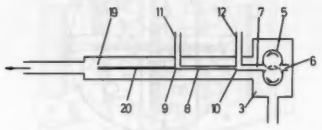
ii. a push rod connected to said cable and positioned contiguous to batteries at said position, said meter means energizing motion of said cable whereby said push rod moves a leaky battery to said second conveyor means.

3,938,369

ARRANGEMENT FOR CONTROLLING THE VISCOSITY OF A FLUID

Adriaan de Bok, Leerdam, Netherlands, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,703
Claims priority, application Netherlands, May 4, 1973, 7306289
Int. Cl.² G01N *11/04*
U.S. Cl. 73—55 **9 Claims**



1. A system for controlling the viscosity of a fluid, comprising:

a constant output pump for pumping at least a portion of the fluid;

a measuring capillary tube through which the output of the pump is forced to develop a differential pressure along said measuring capillary tube;

means for sensing the differential pressure in said capillary tube and for developing a control signal for controlling the viscosity of said fluid;

a second capillary tube associated with the measuring capillary tube for receiving the fluid discharged therefrom; and

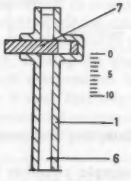
means for providing an elastic fluid space connected to a point between the measuring capillary tube and the second capillary tube, whereby said elastic fluid space cooperates with the resistance of the second capillary tube to dampen variations in the static pressure of the fluid so that the differential pressure in the measuring capillary tube is not effected thereby.

3,938,370

DEVICE FOR MEASURING SEDIMENTATION RATES

Ulrich Kirsch, Melsungen, and Wolfgang Buhler, Obermelsungen, both of Germany, assignors to Intermedicat GmbH, Lucerne, Switzerland

Filed Feb. 20, 1974, Ser. No. 444,107
Claims priority, application Switzerland, Feb. 28, 1973, 2948/73
Int. Cl.² G01N *15/04*
U.S. Cl. 73—61.4 **9 Claims**



1. A sedimentation tube for use in measuring the sedimentation rates of erythrocytes in blood plasma, said tube having open upper and lower ends, a scale with a zero point adjacent the upper end of the tube and extending therefrom along the tube for use in determining said sedimentation rate; and means for selectively opening and closing said tube adjacent said upper end, said means having a surface portion extending across the tube when the tube is closed, which surface portion is located precisely at said zero point on the scale whereby filling of said tube with a liquid to said surface portion pre-

cisely locates the zero point of the column of liquid while said means allows the interior of the tube to be opened to the atmosphere to permit escape of air bubbles which may form in the tube between the column of liquid and said means during filling.

3,938,371

DEPTH MEASURING APPARATUS USING REFLECTED ULTRASONIC BEAMS

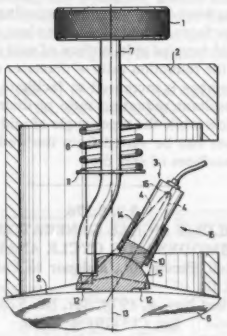
Mamiliano Dini, Island of Elba, Italy, assignor to European Rotogravure Association, Germany

No Drawing. Filed Sept. 27, 1973, Ser. No. 401,381

Claims priority, application Germany, Oct. 3, 1972, 7236314[U]

Int. Cl.² G01B 15/00; G01N 29/00

U.S. Cl. 73—67.8 S **24 Claims**



1. An apparatus for measuring the depth of cells formed in the surface of a material layer comprising:

an ultrasonic sensing head;

adjustable mounting means for adjustably mounting said ultrasonic sensing head comprising;

means for displacing said ultrasonic sensing head at a desired acute angle of substantial magnitude with respect to a perpendicular from said surface of the material layer and

said adjustable mounting means including a housing having means for maintaining the adjustable mounting means in contact with the surface, and

said adjustable mounting means comprising a coupling element having a matched abutment surface contacting said material layer surface and including means rotatably mounted in said housing, and being adjustably mounted to said coupling element whereby said coupling element is moved transversely of said perpendicular upon rotation of said means, and

said coupling element having an additional abutment surface of a predetermined geometric configuration, and including tensioning retainer elements for securing said ultrasonic sensing head to said additional surface of predetermined geometric configuration.

3,938,372

VARIABLE ANGLE ULTRASONIC TRANSDUCER FOR SHEAR WAVES

Donald Orr Sproule, London, England, assignor to Videoson Limited, London, England

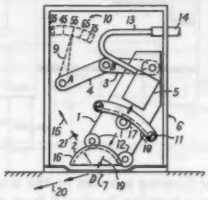
Filed Aug. 26, 1974, Ser. No. 500,692

Claims priority, application United Kingdom, Sept. 7, 1973, 42087/73

Int. Cl.² G01N 29/04

U.S. Cl. 73—67.8 S **10 Claims**

1. An ultrasonic probe, particularly for non-destructive testing of a test piece of known material by generation of ultrasonic shear waves therein, comprising a liquid-retaining cell containing an immersed ultrasonic transducer, the cell having a window in a wall thereof, for placing on a surface of the test piece, the said transducer being mounted for angular movement substantially about a centre located at the cell window, whereby ultrasonic energy is transmitted through the said window to generate shear waves in the said test piece, an



attenuating medium being provided within the cell to attenuate reflected ultrasonic waves therein, a settable scale and pointer combination, said scale being graduated directly in units related to angle of refraction of said shear waves in the test piece and a mechanical linkage for providing an angular positioning of the transducer according to said scale and pointer setting.

3,938,373

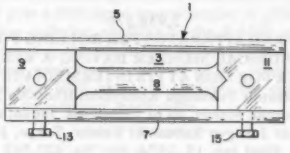
METHOD AND APPARATUS FOR TENSILE TESTING OF METAL FOIL

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Orval W. Wade, Littleton, Colo.

Filed June 27, 1974, Ser. No. 483,858

Int. Cl.² G01N 3/28, 3/08

U.S. Cl. 73—95 **9 Claims**

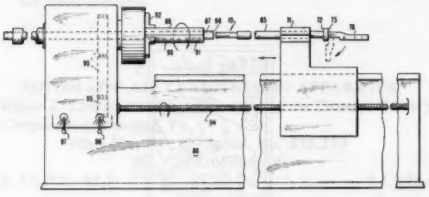


1. An aligning apparatus for use in the tensile testing of metal foil specimens which comprises an alignment box comprising a longitudinal bottom wall and two upright side walls integral with said bottom wall, a first removable grip end member disposed at one end of said alignment box between said upright sides, a second removable grip end member disposed at the opposite end of said alignment box, a first means for securing said first grip end member within said box, a second means for securing said second grip end member within said box, said first and second grip end members being provided with means for receiving opposite end portions of the test specimen and for aligning the test specimen parallel to the sides of said grip end members adjacent the upright sides of said box, said first and second grip end members each having on the sides facing each other female member means for receiving matching male member means; each of said female member means being in a plane located on either side of and perpendicular to the flat plane of the specimen and parallel to the sides of the grip end members.

3,938,374
TOOL FOR FORMING INTERNAL THREADS

Gilbert A. Wadsworth, Jr., Cockeysville, Md., assignor to Dynatherm Corporation, Cockeysville, Md.

Filed Feb. 6, 1975, Ser. No. 547,487
Int. Cl.[2] B21H 3/08
U.S. Cl. 72—104 7 Claims



1. In a tool for forming grooves on the internal surface of a pipe comprising a housing having a bore extending from a groove-forming end portion to a supporting end portion, said housing comprising at least one flexible segment having a radially movable end portion at said forming end portion,

rotatable groove-forming means mounted for rotation in said radially movable end portion of the segment,

forcing means in the bore operative to force said segment end portion radially outwardly so that said groove-forming means may operatively engage the internal surface of a pipe positioned radially outwardly thereof, and actuating means extending from said bore through said supporting end portion for actuating said forcing means to render the latter operative and for releasing such forcing means to render the same inoperative.

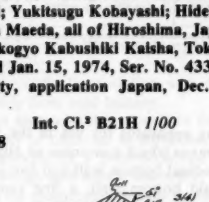
the improvement comprising movable lever means pivotally attached to said actuating means at a point outside of and spaced from said bore for moving the actuating means, and thereby the forcing means, back and forth through a limited distance,

and cam means associated with said lever means for moving and holding the actuating means, and thereby the forcing means, in operative groove-forming position and also for releasing the same from said position.

3,938,375
PROCESS AND APPARATUS FOR ROLLING FORMING A CYLINDRICAL MEMBER HAVING A REDUCED DIAMETER PORTION AT ITS INTERMEDIATE PORTION

Mokuji Koizumi; Yukitsugu Kobayashi; Hidehiko Tsukamoto, and Nobutaka Maeda, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1974, Ser. No. 433,562
Claims priority, application Japan, Dec. 18, 1972, 47-126184
Int. Cl.[2] B21H 1/00
U.S. Cl. 72—108 2 Claims

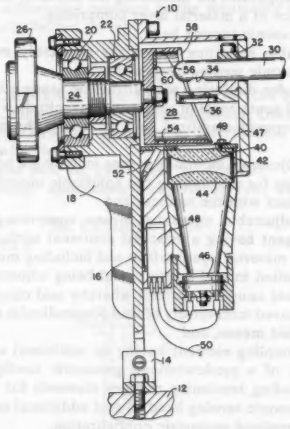


1. In apparatus for rolling forming a cylindrical member having a reduced diameter cylindrical portion at its intermediate portion connected to the opposite ends of said member by conical surfaces by using a cross-rolling forming apparatus in which a pair of rolls are arranged in parallel to each other with a clearance held therebetween for locating the member to be worked therein and driven in the same rotational direction with each other, said rolls being provided with forming dies cooperating with each other each having a top surface and beveled side surfaces extending in the circumferential direction of the respective roll with the width in cross-section of the respective top surfaces cooperating with each other being continuously increased as said rolls rotate, so that said reduced diameter cylindrical portion and said conical surfaces are formed in said cylindrical member by said dies when said cylindrical member is inserted between said rolls so as to be worked thereby, the improvement wherein the width in cross-section each of said beveled side surfaces of said dies is gradually reduced by providing a clearance surface formed in the respective beveled side surface at an appropriate escape angle, thereby permitting the portion of each of said conical surfaces having been formed by the preceding portions of said beveled side surfaces of said dies to be clear of the remaining portions of said beveled side surface of said dies as said rolls rotate so that the reduction ratio of diameter during the working of said member is increased to facilitate the working although the resultant reduction ratio of diameter as a whole can be made low while the taper angle of said conical surfaces of said member can be varied from the wedge angle of said beveled side surfaces of said die.

3,938,376
VOLUME SIGNAL GENERATOR FOR THERMODYNAMIC CYCLE ANALYZERS

Richard C. Bell, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 4, 1974, Ser. No. 520,242
Int. Cl.[2] G01M 15/00
U.S. Cl. 73—115 1 Claim



1. A volume signal generator for thermodynamic cycle analyzers including a light path and apparatus for mechanically varying the amount of light passing through said path in proportion to the instantaneous volume of the combustion chamber of an engine under analysis, comprising:

a. uniformly illuminated, elongated slot means positioned in said light path;

b. axially rotating cam means including a hollow truncated cylinder positioned adjacent to said slot means so as to obscure a portion of said slot means proportional to the axial height of that portion of the cylinder which is closest to said slot means at any given moment at the cylinder's rotation, the truncated surface of said cylinder being so

shaped that the axial length of the cylinder wall at any point is proportional to the volume of the combustion chamber of the engine under analysis when that point is nearest said slot means;

c. light source means for said light path located inside said hollow cylinder, said cylinder wall having at least one opening formed therein; and

d. photoelectric means positioned adjacent said cylinder for receiving light impulses through said opening in said cylinder wall at a predetermined point in the rotation of said cylinder, said light source being a single light source illuminating both said slot means and said opening.

3,938,377

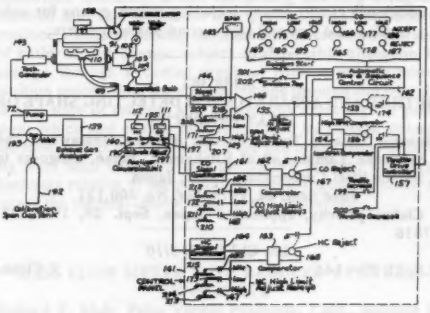
METHOD AND APPARATUS FOR PRODUCTION HOT TESTING OF ENGINES UNDER LOAD

Vernon G. Converse, III, Franklin, Mich.; Edwin L. Cline, Pasadena, and Leland P. Tinkham, Desert Hot Springs, both of Calif., assignors to Scans Associates, Inc., Livonia, Mich. and Clayton Manufacturing Co., El Monte, Calif., part interest to each

Filed Jan. 7, 1974, Ser. No. 431,299

Int. Cl.² G01L 5/13

U.S. Cl. 73—117 **42 Claims**



1. A method of production hot testing assembled internal combustion engines before installation in a motor vehicle to reveal malfunctions therein by an analysis of said engine's exhaust gas emissions, said method including the steps of providing a suitable testing apparatus in which said engines can be run, placing said engine in said testing apparatus, providing means to load the engine based on its cubic displacement which provides as closely as possible a torque load on the engine which is the same as the engine would experience if said engine were installed in a motor vehicle of a suitable weight class, connecting the engine to said loading means, starting the engine and withdrawing an exhaust sample from the exhaust system of the engine, operating the engine in more than one test mode at which malfunctions of the engine are likely to occur, with a test in the high cruise mode occurring first regardless of the number of other tests performed so that the effects of new engine tolerances and initial startup, as well as warm-up effects such as those presented by the choke will not affect said test modes, and measuring the value of CO and HC in the exhaust sample at each mode of operation, comparing the measured value of the CO and HC found in the exhaust at each mode of operation with permissable levels of CO and HC for each mode for the particular engine being tested, and indicating by any suitable means which, if any, test values exceed the prescribed permissable values.

3,938,378

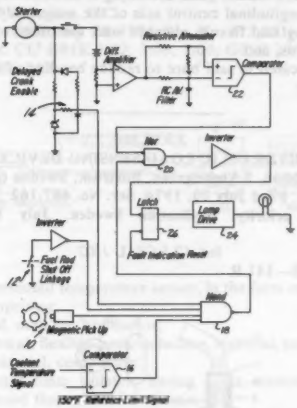
ENGINE COMPRESSION TESTING

Howard E. Fineman, Newton Centre; Steven M. Schlosser, Peabody; Lawrence M. Hill, Acton, and Richard E. Hanson, Winchester, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1974, Ser. No. 500,418

Int. Cl.² G01M 15/00

U.S. Cl. 73—117.2 **1 Claim**



1. A method of testing compression capabilities of multicylinder engines: said method comprising the step of cranking the engine with an electrically-energized starter motor; providing a first analog signal representative of instantaneous peak starter motor current; providing a second analog signal representative of average starter motor current; applying the first and second signals to a comparator; providing a NAND gate; applying to the NAND gate a third signal representative of engine operating temperature; applying to the NAND gate a fourth signal representing combustion inhibition; applying to the NAND gate a fifth signal representative of piston position in the engine cylinder; applying to the NAND gate a sixth signal representing the attainment of steady state starter motor operation; applying the outputs of the comparator and NAND gate to a NOR gate; and applying the output of the NOR gate to an indicator mechanism.

3,938,379

ELECTROMECHANICAL TRANSDUCER

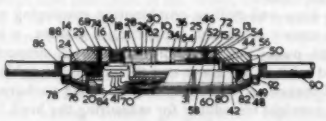
Rowland Hardy Bingham, Littlehampton, England, assignor to National Research Development Corporation, London, England

Filed Jan. 10, 1974, Ser. No. 432,394

Claims priority, application United Kingdom, Jan. 12, 1973, 1674/73

Int. Cl.² G01L 1/22

U.S. Cl. 73—141 A **22 Claims**



1. An electro-mechanical transducer including a substantially cylindrical main body disposed about a longitudinal central axis, said main body including:

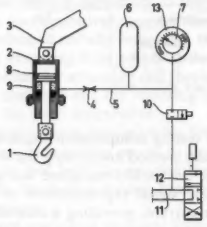
two end portions, each of said end portions having a longitudinal axial bore extending at least part way therethrough,
a flexure element disposed in a plane normal to said central axis, said flexure element having a pair of mutually parallel surfaces connected by a rim,
at least one strain gauge mounted on said parallel surfaces of said flexure element,
at least one first pillar extending in a direction parallel to the longitudinal central axis of the main body and connecting said flexure element with one of said end portions,
at least one second pillar extending in a direction parallel to the longitudinal central axis of the main body and connecting said flexure element with the other of said end portions, and
a rod located in said bore to reduce bending of said transducer.

3,938,380

HYDRAULIC LOAD SENSING DEVICE

Einar Karlsson, 5 Vinkelgatan, Burtrask, Sweden (S-930 20)

Filed July 10, 1974, Ser. No. 487,162
Claims priority, application Sweden, July 12, 1973, 7309779
Int. Cl.² G01L 1/02
U.S. Cl. 73—141 R **2 Claims**



1. An hydraulic load-sensing arrangement interposed between a load carrying device and a hoisting device which is comprised of a hydraulic piston and cylinder unit, said cylinder being secured to said hoisting device and said load carrying device being secured directly to the piston rod which extends through the lower end of said cylinder thereby effecting an application of pressure to the hydraulic medium located between the piston and cylinder proportional to the weight of the load, and conduit means including a throttling point connecting the hydraulic medium within said cylinder to a closed hydraulic system including an accumulator and a pressure gage.

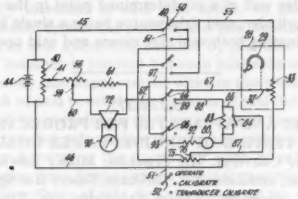
3,938,381

SENSITIVE DEEP-WELL-DRILLING HOOK LOAD MEASURING SYSTEM

Herbert A. Rundell, and Russell W. Hall, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,332
Int. Cl.² G01L 5/10
U.S. Cl. 73—143 **2 Claims**

1. In a deep-well-drilling combination employing a derrick having a crown block for supporting a sheave, a traveling block with pulley for supporting a hook to support a drill string and a bit at the lower end thereof, and a cable passing over said sheave and pulley, said cable being anchored at one end with a weight transducer for measuring the hook load, the improvement comprising in combination
a potentiometer having a sliding contactor actuated by said transducer in proportion to said hook load,
means for applying an electromotive force to said potentiometer,
a second potentiometer connected to said electromotive force and having a sliding contactor,
circuit means for connecting said sliding contactors to measure the difference in electric potential,
said circuit means comprising
a variable resistor,



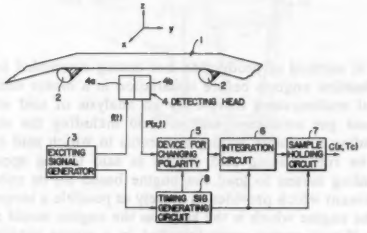
a meter for measuring said difference in potential,
a fixed resistor, and
amplifier means connected across said fixed resistor for amplifying the input to said meter,
a precision third potentiometer,
a null meter, and
additional circuit means including switch means for calibrating said first and said second potentiometers.

3,938,382

METHOD AND APPARATUS FOR DETECTING SHAPE OF FLAT PRODUCTS

Tsutomu Takada; Toshio Toyota; Akinobu Ogasawara, and Syunsuke Yamato, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sept. 24, 1973, Ser. No. 400,121
Claims priority, application Japan, Sept. 29, 1972, 47-97816
Int. Cl.² G01L 5/10
U.S. Cl. 73—144 **7 Claims**

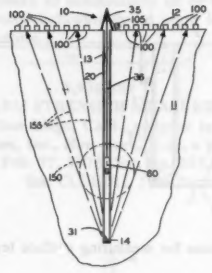


1. A method of detecting the shape of flat products, which comprises:
applying, through an exciter, a time varying exciting signal generated in an exciting signal generator to an object along the width thereof, as an exciting force;
concurrently detecting the deflection of said object taking place due to the application of said exciting force at a plurality of points along the width of said object; and
correlating the exciting signal and the detected values of deflection in a signal processing circuit for determining the tension at respective points on said examined object, so as to develop the tension distribution along the width of said examined object, whereby the shape of said examined object may be determined.

3,938,383
METHOD AND APPARATUS FOR DETECTING THE THERMAL CHARACTERISTICS OF A SUBSURFACE FORMATION IN SITU

Wayne L. Sayer, 2851 N. Inyo St., Bakersfield, Calif. 93305

Filed Sept. 19, 1974, Ser. No. 507,275
Int. Cl.[2] E21B 47/06
U.S. Cl. 73—154 29 Claims

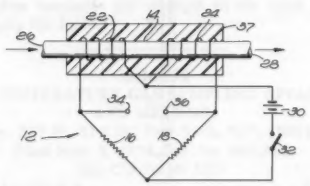


1. A method for detecting the thermal characteristics of a subsurface formation in situ comprising inserting cryogenic material into said formation to a predetermined position to produce a zone of cooling thereabout; conducting a plurality of paths of test energy, subject to detectable alteration by passage through a cooled medium, from a predetermined position spaced from the zone of cooling through and laterally of said zone of cooling; and individually detecting the paths along which said energy has been altered by passage through the zone of cooling to determine the size of said zone of cooling from such detection and the known position of energy discharge relative to the position of the cryogenic material to detect the thermal conductivity of the formation.

3,938,384
MASS FLOW METER WITH REDUCED ATTITUDE SENSITIVITY

Richard F. Blair, Palos Verdes Peninsula, Calif., assignor to Tylan Corporation, Torrance, Calif.

Continuation-in-part of Ser. No. 297,549, Oct. 13, 1972, abandoned. This application July 23, 1973, Ser. No. 381,455
Int. Cl.[2] G01F 1/68; G01P 5/10
U.S. Cl. 73—204 5 Claims



1. A mass flow meter for measuring the flow rate of a fluid flowing in the interior of a sensing conduit, comprising:

a plurality of self-heating sensor element coils comprising two coils having adjacent ends positioned along the flow path of said fluid externally of said sensing conduit one of said sensor elements being closer to one end of said sensing conduit than another of said sensor elements, said sensor element coils being formed of temperaturesensitive resistant wire wound around the outer surface of said sensing conduit and sensing their own temperature modified by said fluid flow;

means for heating said sensor elements;

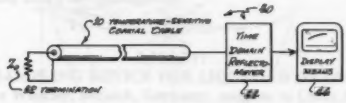
means for detecting the temperature differential of said sensor elements; and

open cell foam material encasing said sensor elements to provide reduced attitude sensitivity.

3,938,385
DISTRIBUTED TEMPERATURE SENSOR

Tibor G. Horwath, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1974, Ser. No. 473,251
Int. Cl.[2] G01K 1/02, 3/00, 7/00; G01R 27/04
U.S. Cl. 73—342 6 Claims



1. A distributed temperature sensor, in the form of a coaxial cable, comprising:

a central, metallic, conductor;

a cylindrical, flexible, nonconductive, material, surrounding the material, comprising:

a plastic foam isolator, having voids randomly interspersed throughout its volume; and

a liquid dielectric having a high ratio of dielectric constant to change in temperature, filling the voids of the isolator; and

an outer conductor surrounding the nonconductive material.

3,938,386
METHOD AND APPARATUS FOR MONITORING TEMPERATURES DURING CATALYTIC REGENERATION FROM A CONTINUOUSLY MOVING INFRARED SCANNING AND DETECTION UNIT FIXEDLY MOUNTED ABOARD AN AIRCRAFT

Armand C. Comfort, Belmont, and Harold D. Messner, Fremont, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 15, 1973, Ser. No. 341,649
Int. Cl.[2] G01J 5/08; B01J 37/08; G01N 25/48
U.S. Cl. 73—355 R 3 Claims

1. In the regeneration of a catalyst located interior of an insulation-clad vessel having an axis of symmetry, by elevating the temperature of said catalyst only after production of hydrocarbon products such as petrochemicals, gasolines, light-fuel oils and the like, has been terminated, the method of monitoring the efficiency of such regeneration process comprising the steps of:

i. prior to operation of said vessel and either production or regeneration processing modes, affixing a plurality of metallic stud members to the metallic sidewall of said vessel, said plurality of metallic stud members extending through said insulation of the vessel, and being associated with a set of imaginary laterally offset spatial positions interior of said vessel for identifying full top-to-bottom interior temperature readings within each catalyst bed when said vessel undergoes regeneration,

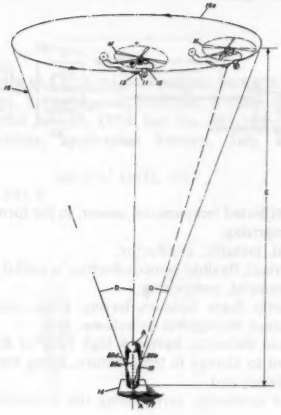
ii. during regeneration of said catalyst, monitoring from an aircraft having known geographical coordinates with respect to said vessel at the earth's surface, infrared energy—in real time—being emitted from said plurality of metallic stud members defining a viewable space of said stud members in a frequency range greater than 300×10^9 but less than 10^{15} Hertz,

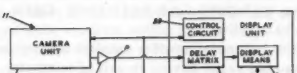
iii. converting said detected infrared energy to electrical signals,

iv. enhancing those portions of said electrical signals based on whether the detected energy represented thereby radiated from all sources including that from said stud members remains stationary during two adjacent scanning cycles as said aircraft overflies said vessel,

v. dynamically indicating temperatures of said catalyst interior of said vessel for the purpose of optimizing said regeneration process by displaying said enhanced signals as a function of geometric and time variables associated with said stud members as viewed from said aircraft, and

vi. cyclically repeating the scanning sequence as said aircraft overflies said vessel on a flight pattern of sufficient height so that, between said scanning cycles, said stud members appear to be stationary with respect to said aircraft.





3,938,387

PRECISION TEMPERATURE TRANSDUCER FOR MEASURING THE SURFACE TEMPERATURE OF THE HUMAN AND ANIMAL SKIN

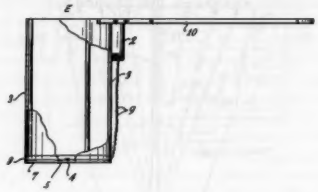
Udo Flesch, Wegscheider Str. 3-4/D-1-20, Berlin, Germany

Filed Sept. 19, 1974, Ser. No. 507,599

Claims priority, application Germany, Mar. 21, 1974, 2414048

Int. Cl.² G01K *1/20, 7/00*

U.S. Cl. 73—359 **3 Claims**



1. An apparatus for measuring surface temperature, comprising:

a temperature sensing means; and

an enclosure for placement adjacent to said surface, the temperature sensing means being disposed in the enclosure, said enclosure being transparent to thermal radiation but preventing convective air flow in the immediate environment of said sensing means, inside of the enclosure, when said sensing means in the enclosure has disposition adjacent to said surface.

3,938,388

THERMOMETER

Josef F. Klingler, Wilmette, Ill., assignor to Thermex, Inc., Chicago, Ill.

Filed Apr. 6, 1973, Ser. No. 348,589. The portion of the term of this patent subsequent to June 19, 1990, has been disclaimed.

Int. Cl.² G01K *5/08*

U.S. Cl. 73—371 **17 Claims**

1. In a thermometer adapted to be subjected to temperatures above the normal reading temperature range thereof without adversely affecting the accuracy of the thermometer in subsequent use thereof at reading temperatures, said thermometer having a stem provided with a longitudinal capillary through-bore, means defining a reservoir chamber at an inner end of the bore, scale means on the stem for indicating reading temperatures, and indicator liquid in said chamber and expandable as an incident of subjecting of the thermometer to reading temperatures to extend outwardly through said bore to adjacent said scale for providing a reading of the temperature, the improvement comprising means defining an expan-

sion chamber communicating with said bore outwardly of the scale means and defining an open outlet at its outer distal end having a capillary cross section precluding gravitational flow of the indicator liquid outwardly therethrough, said expansion chamber being arranged to accommodate a preselected volume of indicator liquid thermally expanded into said expansion chamber thereby to preclude loss of indicator liquid from the thermometer by thermal expansion through said outlet notwithstanding the subjecting of the thermometer to elevated temperatures substantially above said reading temperatures and permitting return of substantially all of the preselected volume of expanded indicator liquid upon lowering of the subjected temperature.

3,938,389

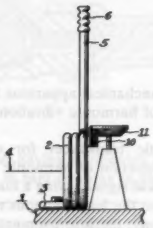
HAND AND ARM STRENGTH MEASURING DEVICE

Harry Y. Kella, San Diego, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 27, 1975, Ser. No. 553,563

Int. Cl.² G01L 5/06

U.S. Cl. 73—381 **2 Claims**



1. A hand and arm strength measuring device, comprising a support platform;

a substantially helical spring having one end extending at substantially right angles to the axis of the spring and affixed to the platform and another end extending at substantially right angles to the axis and at substantially right angles to the one end and substantially perpendicularly to the plane of the platform;

a handle at the other end of the spring; and

meter means coupled to the spring at the other end thereof in a manner whereby when the handle is gripped manually and moved in a direction about the axis of the spring in a plane substantially perpendicular to said axis the meter means indicates the force applied to the handle and therefore measures the strength of the hand and arm applying the force.

3,938,390

HIGH TEMPERATURE GAS SAMPLING APPARATUS AND METHOD

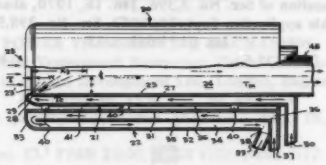
Jerry Grey, 359 W. 21st St., New York, N.Y. 10011

Filed Sept. 5, 1974, Ser. No. 503,916

Int. Cl.² G01N 1/24

U.S. Cl. 73—421.5 R **16 Claims**

1. A process for sampling a high temperature gas mixture for minimizing chemical changes in the sample during cooling of the sample to provide a cooled sample of the mixture having a chemical composition very close to the original chemical composition of the high temperature gas mixture and for forming spheroids of the condensable constituents, said process comprising the steps of extracting a gas sample of the high temperature gas mixture, directing the sample along a passageway, expanding a relatively cool diluent fluid at or above sonic velocity and directing the expanded diluent fluid into the passageway as a conical shaped curtain of diluent fluid with the apex of the cone directed in the direction of the flow of diluent fluid and with the apex of the cone formed generally at the center of the passageway to rapidly mix the cool diluent



with the high temperature gas mixture as the gas sample is extracted along the passageway.

3,938,391

SAMPLING DEVICE FOR LIQUEFIED GASES

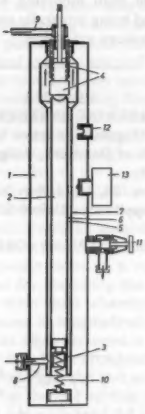
Dietmar Winkler, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Feb. 19, 1975, Ser. No. 551,139

Claims priority, application Germany, Feb. 23, 1974, 2408845

Int. Cl.² G01N 1/22

U.S. Cl. 73—421.5 R **14 Claims**



11. A method for transferring a sample of a liquid from a receptacle to a compressed-gas vessel comprising the steps:

providing a double-walled sample-receiving container with the compressed-gas vessel;

insulating the sample-receiving container with the atmosphere of the compressed-gas vessel;

venting said liquid between the double walls of the sample-receiving container until the sample-receiving container is cooled at least to the boiling point of the said liquid;

filling the cooled sample-receiving container with the said liquid;

releasing at least a portion of said liquid from the sample-receiving container into the compressed gas vessel; and

evaporating said released liquid in the compressed-gas vessel.

3,938,392

PIPETTE

John J. Rodrigues, Orinda, Calif., assignor to Rodrigues Associates, Inc., Oakland, Calif.

Continuation of Ser. No. 3,398, Jan. 16, 1970, abandoned. This application Sept. 20, 1973, Ser. No. 398,956

Int. Cl.² B01L 3/02

U.S. Cl. 73—425.6 11 Claims

1. A pipette comprising a tube of plastic and a bulb of flexible plastic, said bulb including a bottom extension of smaller diameter and being integrally united to said tube at the lower end of said bottom extension.

3,938,393

MEASURING INSTRUMENTS

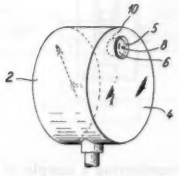
Rasmus Langballe Mogensen, Aarhus V, and Hans Erik Sallerup, Viby J., both of Denmark, assignors to Tempress A/S, Viby J., Denmark

Filed Dec. 24, 1974, Ser. No. 536,241

Claims priority, application United Kingdom, Dec. 28, 1973, 60066/73

Int. Cl.² G01P 1/02; G01L 19/14

U.S. Cl. 73—431 6 Claims



1. A measuring instrument comprising a rigid instrument casing having an opening in a wall portion thereof and a security disc or stopper member sealingly inserted in said opening so as to be able to be blown out from the opening by an excessive overpressure inside the casing, said instrument further having a pressure equalizing bellow member located inside the casing and the interior of which is connected to the atmosphere outside the casing through vent hole means in the wall of the casing, characterized in that the bellow member is mounted in connection with the blow out member, the said vent hole means being provided in the blow out member.

3,938,394

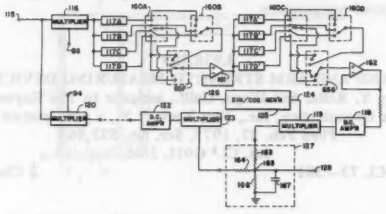
COMBINATION BALANCE ANALYZER AND VIBRATION SPECTRUM ANALYZER

Robert S. Morrow, Columbus, and Lloyd D. Penn, Johnstown, both of Ohio, assignors to IRD Mechanalysis, Inc., Columbus, Ohio

Filed Nov. 30, 1973, Ser. No. 420,594

Int. Cl.² G01M 1/16

U.S. Cl. 73—462 5 Claims



1. In an electro-mechanical apparatus for detecting instantaneous amplitude of harmonic vibrations of a rotating body including:

an electromagnetic transducer for converting instantaneously some function of harmonic displacement into a complex electrical signal having a fundamental frequency corresponding to the instantaneous rotational velocity of said rotating body, the improvement comprising:

independent means for generating a reference signal having uniformly increasing frequency said means being distinct from the said rotating body and also being distinct from said electromechanical transducer;

signal filter means connected to receive the said complex electrical signal;

signal filter means being responsive to said reference signal for instantaneously producing a resultant signal substantially free of components of the said complex electrical signal other than those at the existing instantaneous frequency of the said reference signal.

3,938,395

BICYCLE SPEEDOMETER TIRE DRIVE GEAR ADAPTOR ASSEMBLY

Charles F. Henecke, Oak Park, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

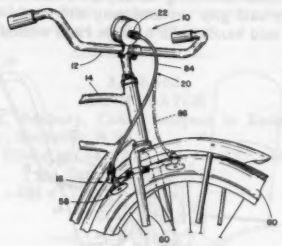
Filed Jan. 31, 1974, Ser. No. 438,225

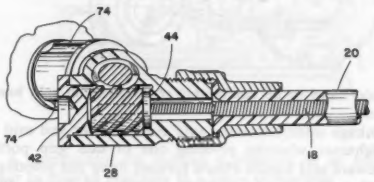
Int. Cl.² F16H 37/00

U.S. Cl. 74—12 6 Claims

1. A bicycle speedometer and drive assembly, comprising; a speedometer having a rearwardly projecting boss extending on a first axis, a flexible shaft connected to said speedometer boss, an integrally formed housing having a pair of passageways therein with the axes of said passageways arranged at an obtuse angle to each other and offset from each other, bracket means for connecting said housing to a bicycle fork, a helical gear in each passageway, an opening in said housing communicating said pair of passageways with each other for enabling engagement between said helical gears, each of said gears having teeth, a shaft extending axially from one of said gears, and a tire drive wheel for engaging the side of the tire of said bicycle and fixed to said shaft on said one gear for rotating said gears and flexible shaft in response to rotation of said tire for operating said speedometer, the axes of the drive wheel being substantially perpendicular to the speedometer boss first axis so that the flexible shaft does not have any significant

bend, one of said gears being rotatably supported in the housing by engagement between the teeth and the associated pas-





sageway, said one gear having an opening therein, said flexible shaft being received in said opening in said one gear.

3,938,396

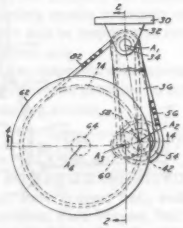
PROGRAMMABLE MULTIPLE STEP INDEXING DRIVE MECHANISM

John Henry Brems, 32867 White Oaks Trail, Birmingham, Mich. 48010

Filed Sept. 26, 1974, Ser. No. 509,407

Int. Cl.² F16H *25/08*

U.S. Cl. 74—55 **7 Claims**



1. In a basic intermittent indexing mechanism comprising a frame, an input member, an output member and a plurality of intermediate driving members having a driving connection between each adjacent pair of said members, of the type which generates a periodic dwell interval of said output member through the kinematic superposition of substantially linear and substantially harmonic oscillating motion components including those which include multiple harmonic components, a dwell extension mechanism which comprises:

a. timing means driven by said input member with substantial proportionality,

b. means for engaging and disengaging one of said driving connections,

c. actuator means connecting said timing means and said means for engaging and disengaging, said actuator means being synchronized to effect said disengagement with one of said periodic dwell intervals of said basic intermittent indexing mechanism and re-engagement within another of said periodic dwell intervals.

3,938,397

POWER TRANSMITTING MECHANISM

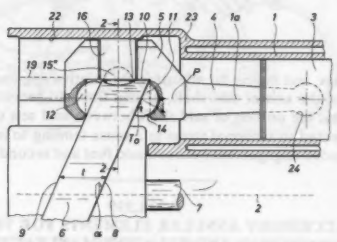
Gunnar Olaf Vestergaard Rasmussen, Odense, Denmark, assignor to Havera Development Ltd., London, England

Filed July 30, 1974, Ser. No. 493,144

Claims priority, application Denmark, Aug. 15, 1973, 4491/73

Int. Cl.² F16H *23/00*; F22B *9/08*; F04B *1/12*

U.S. Cl. 74—60 **4 Claims**



1. A reciprocation-piston device such as an engine or pump and power transmitting mechanism therefor comprising a plurality of cylinders arranged circumferentially around the main axis of the device, the cylinder axes being parallel to the said main axis, each piston being connected to a claw-shaped crosshead by way of a piston rod, said crosshead being rotatable about its longitudinal axis and adapted to receive a swash-plate in a recess therein to operatively connect said crosshead and swash-plate, said swash-plate being fixedly secured to said main shaft at one end thereof and positioned between a main thrust block and a rear thrust block at the other end thereof, said main and rear thrust blocks being mounted eccentrically within said crosshead relative to the longitudinal axis of said crosshead, an axially extending guide slot within the housing for said cylinders, a semi-circular outwardly facing bearing surface provided on said crosshead slidable within said guide slot, a pair of second thrust blocks mounted symmetrically in said crosshead on opposite sides of a vertical longitudinal plane of said crosshead for absorbing the force components perpendicular to said main shaft whereby said crosshead is pivotally journalled around its longitudinal axis, the centres of said second thrust blocks being arranged in a plane perpendicular to the longitudinal axis of the crosshead and in the middle of said recess of the crosshead, the two second thrust blocks being adapted to slide on the end surface of said swash-plate within said recess, said end surface of the swash-plate and the overlying surfaces of said second thrust blocks being arcuate and complementary so that said second thrust blocks and said outwardly facing bearing surface of the crosshead absorb the transverse components of the rotational force developed.

3,938,398

TORQUE-TRANSMITTING DEVICES

Joseph Louis Bloom, Droitwich, and Harry Sinister Bottoms, Solihull, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 3, 1974, Ser. No. 485,454

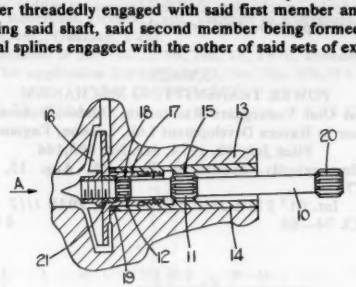
Claims priority, application United Kingdom, July 9, 1973, 32665/73

Int. Cl.² F16H *21/12*

U.S. Cl. 74—63 **5 Claims**

1. A torque-transmitting device, comprising a shaft having two axially-spaced sets of external splines, a first member surrounding said shaft and formed with internal splines for

engagement with one of said sets of external splines, a second member threadedly engaged with said first member and surrounding said shaft, said second member being formed with internal splines engaged with the other of said sets of external



splines, and means for adjusting the relative angular positions, about the axis of said shaft, of said first and second members so that the portion of said shaft between said sets of splines is subjected to torsional stress in a sense tending to increase the threaded engagement between said first and second members.

3,938,399

ACCESSORY ANNULAR ELEMENTS FOR TEXTILE MACHINERY AND RELATIVE MANUFACTURING PROCESS

Lucio Delfiol, Milan, and Luigi Marizzoli, Siziano (Pavia), both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Sept. 25, 1973, Ser. No. 400,697
Claims priority, application Italy, Dec. 29, 1972, 33880/72
Int. Cl.[2] D04R *3/02*
U.S. Cl. 74—232 **2 Claims**

1. In an annular element adapted to be used as a part for textile machinery, comprising a layer of cross-linked elastomeric composition based on an elastomer selected between nitrile and polyurethane rubber, constituting the outer surface of said annular element, a helically wound textile reinforcement, and a second layer of cross-linked elastomeric composition based on an elastomer selected between nitrile and polyurethane rubber, constituting the inner surface of said annular element, the improvement consisting essentially in that the helically wound textile reinforcement is constituted by a plurality of wound layers of a non-woven fabric of synthetic fibers selected between polyamide and polyester fibers, impregnated by a cross-linked elastomeric composition based on an elastomer selected between nitrile and polyurethane rubber, said non-woven fabric having prior to its impregnation by said elastomeric composition a weight ranging between 10 and 50 g/m^2, said plurality of wound layers of non-woven fabric being also able to constitute the inner surface of said annular element.

3,938,400

SINGLE LEVER FORWARD-REVERSE CONTROL

Peter P. Konyha, Port Washington, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

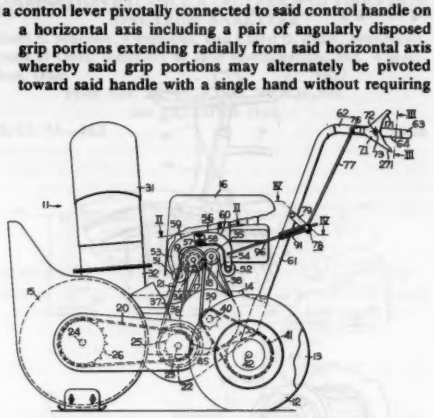
Filed Oct. 2, 1974, Ser. No. 511,384
Int. Cl.[2] F16H *7/12, 7/00*; B62D *11/00*
U.S. Cl. 74—242.1 R **8 Claims**

1. A forward-reverse control for a vehicle of the type having a power unit and drive means including forward and reverse drive belts connected in driven relation to said power unit, said control comprising:

a belt tightener pivotally mounted on said vehicle having forward and reverse idler pulleys in confronting relation to said forward and reverse belts, respectively, whereby pivotal movement of said tightener in one direction effects forward drive and pivotal movement in the opposite direction effects reverse drive,

a control handle,

a control lever pivotally connected to said control handle on a horizontal axis including a pair of angularly disposed grip portions extending radially from said horizontal axis whereby said grip portions may alternately be pivoted toward said handle with a single hand without requiring



said hand to be completely removed from said handle, and

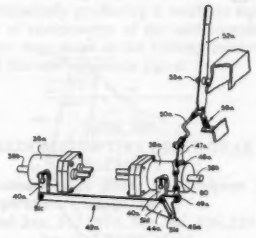
a linkage interconnecting said control lever and said belt tightener whereby pivoting one of said grip portions toward said handle effects forward drive and pivoting the other of said grip portions toward said handle effects reverse drive.

3,938,401

TWO-SPEED MOTOR CONTROL FOR DUAL HYDROSTATIC TRANSMISSIONS

James J. Bauer, Lisbon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Sept. 24, 1973, Ser. No. 400,462
Int. Cl.[2] G05G *9/00*
U.S. Cl. 74—471 R **6 Claims**



1. A two-speed control for dual hydrostatic motors each having a rotating piston group and a swash plate inclinable to a high or low speed position of piston displacement comprising a shift lever interconnecting the swash plates of the motors operable in one direction to cause both swash plates to be shifted to one position and vice versa, a manual control member movable between high and low speed positions, and a linkage connecting the manual control member and shift lever operable upon movement of the manual control member to move the shift lever in one or the other of said positions corresponding to either the high or low speed positions of the swash plates, and wedging means acting to yieldably hold said lever in the position selected against the returning force acting on the swash plates by said piston groups including a slot formed in the shift lever at one end adjacent one motor, a swash plate control arm associated with the swash plate of said motor, guide means received in said slot connected to said swash plate control arm and another swash plate control arm associ-

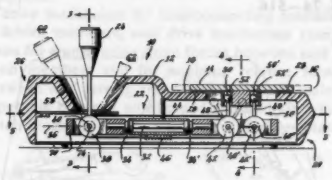
ated with the swash plate of the other motor pivotally connected to the opposite end of said lever, said slot inclined relative to the shift direction of said shift lever producing a wedging action on said guide means acting to hold the swash plate control arms firmly against the returning force in either of said shifted positions of the shift lever.

3,938,402

MANIPULATOR

Paul Citrin, Danbury, Conn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 14, 1974, Ser. No. 497,308
Int. Cl.² G05G 7/10
U.S. Cl. 74—491 **14 Claims**



1. A manipulator for moving a platform in an accurate manner to desired positions in a plane comprising

a housing and a platform supported on the housing to enable movement of the platform in a plane;

an actuator mounted to the housing for rotation about an actuator axis which is generally parallel to the plane;

a control lever mounted to the actuator for pivot motion about a lever pivot axis which is generally transverse to the actuator axis;

coupling means mounted to the actuator with pivot movement about a coupler axis which is parallel to the lever pivot axis for effectively slidingly engaging the platform to drive it for movement in the plane in response to pivot motion of said means about the coupler axis and rotational movement of the actuator about its actuator axis; and

means mounted on the actuator for connecting the control lever to the coupling means to impart movement thereof about the coupler axis in response to control lever movement about its pivot axis,

whereby the platform responds with movement in the plane when the control lever is actuated to rotate the actuator or pivot the coupling means.

3,938,403

MULTIRATIO POWER TRANSMITTING DEVICE

James M. Donaldson, Fort Wayne, Ind., assignor to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Feb. 27, 1974, Ser. No. 446,154
Int. Cl.² F16H 55/30, 55/52
U.S. Cl. 74—217 CV **14 Claims**

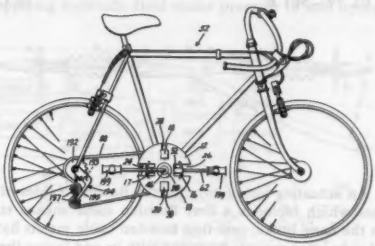
1. A multiratio drive comprising:

a. a drive plate mounted for rotation about an axis and means for drivingly coupling said drive plate to a source of motive power,

b. an even numbered plurality of driven elements mounted to said drive plate for sliding movement radially of said axis, said driven elements being disposed in a generally circular array, alternate ones of said driven elements including means for drivingly engaging an endless drive element, the remaining ones of said driven elements being in slidable contact with said endless drive element,

c. cam means mounted for rotation about said axis and operatively engaging said driven elements for positioning said driven elements at selected ones of a plurality of radially spaced-apart positions in response to relative rotational movement between said driven elements and said cam means,

d. detent means coupled between said driven elements and said cam means for restraining same against relative movement, and



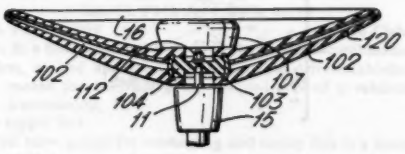
e. shift means for causing selected rotational movement between said driven element and said cam means to thereby alter the relative rotational positions thereof, the radial displacement of all said driven elements from said axis being generally equal for all relative positions of said driven elements and said cam means.

3,938,404

ENERGY ABSORBING STEERING ASSEMBLY

Genyo Murase, Nagoya; Hisahal Mineda, and Yozo Yamaguchi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 256,872, May 25, 1972, Pat. No. 3,822,608. This application Apr. 17, 1974, Ser. No. 461,734
Claims priority, application Japan, May 25, 1971, 46-35819; May 28, 1971, 46-37156; May 31, 1971, 46-37678
Int. Cl.² B62D 1/10
U.S. Cl. 74—492 **6 Claims**



1. A steering wheel mounting apparatus comprising:

a hub member securely mounted on the top end of a steering shaft of a vehicle and provided with a convex spherical periphery;

a supporting member connected to the spokes of a steering wheel and provided with a concave spherical inner circumference corresponding with said convex periphery of said hub member; and

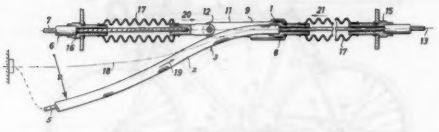
radially extending connecting means for shearably connecting said hub member and said supporting member coupled to each other.

3,938,405

ACTUATING MECHANISM FOR BOWDEN CABLES OF A HAND BRAKE

Karl Sommerer, Stuttgart-Zuffenhausen, Germany, assignor to Dr.-Ing. H.c.F. Porsche Aktiengesellschaft, Firma, Germany

Filed May 17, 1974, Ser. No. 471,051
Claims priority, application Germany, May 17, 1973, 2324871
Int. Cl.² F16C 1/10
U.S. Cl. 74—501 R 12 Claims



1. An actuating installation for the Bowden cables of hand brakes which includes a first Bowden cable means starting from the hand brake, said first Bowden cable means having a fixed support as regards its casing with its end facing the hand brake and being movably supported with its casing end opposite the hand brake, and the first Bowden cable means being operatively connected with a second Bowden cable means by way of a transmission means, characterized in that the transmission means includes an adjusting means operatively connected with the free end of the casing of the first Bowden cable means, the adjusting means being secured at the core of the second Bowden cable means, and the adjusting means includes a support freely movable in such a manner that during a brake actuation the cores of the two Bowden cable means are movable in directions opposite one another.

3,938,406

FORCE LIMITING DEVICE FOR A MOTOR VEHICLE PARKING BRAKE

Kenneth J. Nisbet, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 28, 1974, Ser. No. 501,420
Int. Cl.² G05G 1/14, 1/04
U.S. Cl. 74—512 3 Claims

1. A force limiting device for a cable actuated mechanism comprising a cable constructed to be connected to said mechanism,

an actuator member connected to said cable and displaceable between a cable tension released position and a cable tension applied position,

a movable fulcrum member and said actuator member being pivotally supported on said fulcrum member,

a support structure and said fulcrum member being mounted on said support structure and displaceable relative to said structure between a normal support position and a force limiting position,

spring means urging said fulcrum member to said normal support position,

said actuator member being constructed to transmit a tension force from said cable to said fulcrum member that urges said fulcrum member from said normal support position to said forced limiting position,

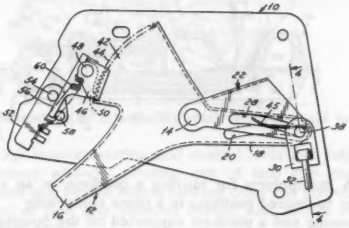
said fulcrum member being displaceable from said normal support position to said force limiting position in response to a level of tension in said cable that exceeds a predetermined amount.

3,938,407

VARIABLE RATIO PARKING BRAKE CONTROL

Kenneth J. Nisbet, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 28, 1974, Ser. No. 501,422
Int. Cl.² G05G 1/04
U.S. Cl. 74—516 2 Claims



1. A variable ratio brake control for a vehicle brake;

said control including a pivotally supported manually operated lever having a cam surface;

said lever being angularly displaceable from a brake released position to a brake applied position;

said cam surface having an outer end remote from the pivot axis of said lever and an inner end closer to said pivot axis than said outer end;

a force transmitting device slidably engaging said cam surface and constructed to be coupled to a wheel brake;

a spring means engaging said device and urging said device to said outer end of said cam surface;

said device being displaced from said outer end to said inner end in response to displacement of said lever from said brake released position to said brake applied position and a brake applying load on said force transmitting device that exceeds a predetermined amount.

3,938,408

DIFFERENTIAL DRIVE MECHANISM

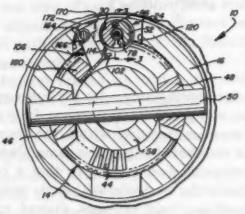
Jerry F. Baremor, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 374,532, June 28, 1973, abandoned.
This application Feb. 10, 1975, Ser. No. 548,711
Int. Cl.² F16H 1/44; F16D 23/10
U.S. Cl. 74—711 13 Claims

1. A drive mechanism for interconnecting rotatable driving and driven members, said drive mechanism comprising: gear means for transmitting drive forces between said driving and driven members and for enabling relative rotation to occur between said driving and driven members; main clutch means operable between an engaged condition in which said main clutch means is effective to retard relative rotation between said driving and driven members and a disengaged condition; and actuator means for effecting operation of said main clutch means from the disengaged condition to the engaged condition in response to a predetermined rate of relative rotation between the driving and driven members, said actuator means including a flyweight, an axially extending member mounted for rotation, drive means for rotating said axially extending member about its axis at an angular velocity which varies as

a function of the relative rotation between the driving and driven members, a stop member mounted on said axially extending member for rotation therewith, support means for pivotally supporting said flyweight on said stop member for rotary movement therewith and for radially outward movement of at least a portion of said flyweight relative to said stop member away from the axis of rotation of said axially extending member under the influence of centrifugal force, means for effecting operation of said main clutch means from the disengaged condition to the engaged condition upon outward movement of said flyweight to a predetermined position, and stop means on said stop member for engaging said portion of said flyweight and limiting the extent of outward movement of said portion of said flyweight beyond said predetermined position to absorb at least a portion of the loading on said pivotal support.

13. A drive mechanism for interconnecting rotatable driving and driven members, said drive mechanism comprising: gear means for transmitting drive forces between said driving and driven members and for enabling relative rotation to occur between said driving and driven members; main clutch means operable between an engaged condition in which said main clutch means is effective to retard relative rotation between said driving and driven members and a disengaged condition; and actuator means for effecting operation of said main clutch means from the disengaged condition to the engaged condition in response to a predetermined rate of relative rotation between the driving an driven members, said actuator means including a flyweight, an axially extending member mounted for rotation, drive means for rotating said axially extending member about its axis at an angular velocity which varies as a function of the relative rotation between the driving and driven members, support means for pivotally supporting said flyweight for rotation with said axially extending member and for radially outward movement of at least a portion of said flyweight away from the axis of rotation of said axially extending member, means for effecting operation of said main clutch means from the disengaged condition to the engaged condition upon outward movement of said flyweight to a predetermined position, and stop means for engaging said portion of said flyweight and for rotatably moving with said flyweight to limit the extent of said radially outward movement of said portion of said flyweight beyond said predetermined position to absorb at least a portion of the loading on said pivotal support and to prevent retardation of rotation of said flyweight by said stop means when said radially outward movement is thereby limited.



3,938,409

CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS OF AUTOMOTIVE VEHICLES

Sumio Uozumi, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

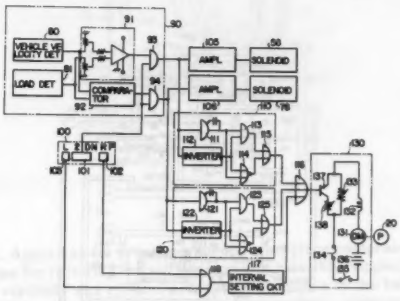
Filed Sept. 4, 1973, Ser. No. 393,881

Claims priority, application Japan, Sept. 8, 1972, 47-89518

Int. Cl.[2] B60K *41/18*; F16H *3/74*; F04B *49/00*

U.S. Cl. 74—866 **7 Claims**

1. A control system for controlling hydraulic pressure in a hydraulic control circuit for an automotive vehicle automatic transmission, said hydraulic control circuit including means for automatically shifting gear ratios in said automatic transmission and means for manually selecting an operating range for said transmission, said transmission including clutch and brake means for determining gear ratios for said transmission, hydraulic servo means responsive to hydraulic pressure for operating said clutch and brake means, and conduit means for transmitting hydraulic fluid from said hydraulic control circuit to said servo means, said control system comprising a pump for supplying hydraulic fluid under pressure to said hydraulic



control circuit, means for driving said pump, and a pump drive control circuit for controlling said pump drive means to vary the output of said pump in accordance with operation of said automatic transmission, said pump drive control circuit including means for maintaining said pump output at a lower level when no gear ratio shifting and no range shifting is occurring in said transmission, and means increasing the output of said pump to a higher level for a time period during operation of said servo means when gear ratio shifting or range shifting are occurring.

3,938,410

HYDRAULIC ACTUATING SYSTEM FOR A PAIR OF CONCURRENTLY OPERATING CLUTCHES OR BRAKES

Hansjörg Dach; Horst Furtner, both of Friedrichshafen, and Robert Marion, Lindau, all of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

Filed Sept. 7, 1973, Ser. No. 395,364

Claims priority, application Germany, Sept. 8, 1972, 2244193

Int. Cl. F16h *3/44*; B60k *41/18*

U.S. Cl. 74—869 **10 Claims**

1. In a fluid-operated load-control system, in combination:

first, second and third fluid-actuatable drive-establishing means for controlling the torque ratio of a vehicular transmission;

a supply line;

first valve means for connecting said supply line to a source of high-pressure fluid in a basic position and to a drain in an alternate position;

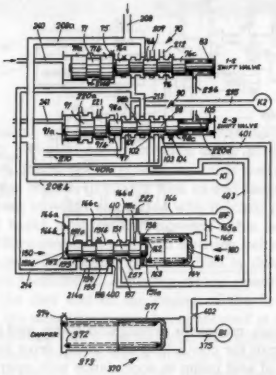
further valve means in tandem with said first valve means controlling the admission of fluid from said supply line to said first drive-establishing means;

second valve means in tandem with said first valve means controlling, jointly with said further valve means, the admission of fluid from said supply line to said second drive-establishing means, said further valve means being effective in a normal position to admit fluid at a relatively high rate from said supply line to said first and second drive-establishing means, said further valve means being effective in an off-normal position to throttle the fluid flow from said supply line to said first and second drive-establishing means, said second valve means having a

downshifting position for cutting off the fluid flow to said third drive-establishing means and an upshifting position for cutting off the fluid flow to said second drive-establishing means;

fluid-feedback means extending from said first drive-establishing means to said further valve means for displacing same from said normal to said off-normal position upon incipient pressure buildup in said first drive-establishing means;

biasing means opposing displacement of said further valve means by said fluid-feedback means;



throttled conduit means extending from said first drive-establishing means to said biasing means for exerting thereon a force-increasing action re-establishing said normal position upon a predetermined rise in the pressure of the fluid admitted to said first drive-establishing means; and

drain means for said second drive-establishing means effective in said upshifting position of said second valve means independently of the position of said further valve means for preventing concurrent pressurization of all said drive-establishing means.

3,938,411

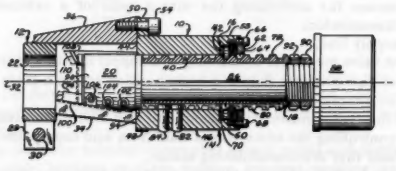
PIPE AND TUBE END PREPARATION APPARATUS

Robert E. Jonelis, Barrington; Dieter Christoph, Streamwood, and Siegfried Schulz, Rolling Meadows, all of Ill., assignors to Midwest Power Corporation, Palatine, Ill.

Filed Dec. 30, 1974, Ser. No. 537,077

Int. Cl.² B23B 3/22

U.S. Cl. 82—4 C **7 Claims**



1. A portable tube end preparation apparatus for preparing a tube end for welding comprising: a tube holder adapted for being fixedly mounted on the tube end to be prepared; a housing connected to said tube holder; said tube holder and said housing having a common central axis; a head carriage mechanism connected to said housing, said head carriage mechanism being movable with respect to said housing parallel to said central axis; a drive train rotatably supported by the head carriage mechanism and movable therewith, said drive train being rotatable about the central axis; and a cutter head assembly connected to said drive train for rotation about the central axis by said drive train, said cutter head assembly having a pair of diametrically opposed chamfer cutters, one chamfer cutter of said pair being adapted for forming an inside chamfer on the tube end, and the other chamfer cutter of said pair being adapted for forming an outside chamfer on the tube end.

3,938,412

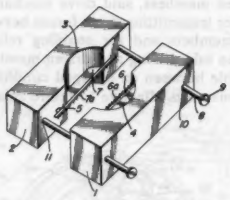
AMPULE SCORER

Meyer Ushkow, West Palm Beach, Fla., assignor to David E. Ushkow, Flushing, N.Y.

Filed June 4, 1973, Ser. No. 366,716

Int. Cl.² B26D 3/08

U.S. Cl. 83—11 **1 Claim**



1. A device for scoring ampoules for subsequent breakage comprising two elongated body portions formed with facing semi-circular recesses, secured within the recesses are relatively thin files members lying in the same plane whose teeth are faced in opposite directions such that a contra-rotating motion imparted to the ampoule will evenly score the neck for subsequent breakage, said recesses shaped to accomodate various dimensioned ampoule tip bulges and body portions on opposite sides of said file members.

3,938,413

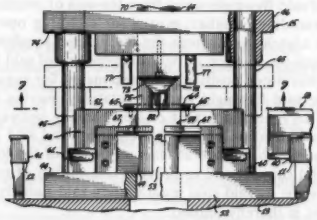
EXTRUSION PREPARATION APPARATUS

Robert J. Goettel; Richard J. Goettel, both of 2727 W. Weldon Ave., Phoenix, Ariz. 85017, and Willis D. Smith, 4050 W. Palo Verde Drive, Phoenix, Ariz. 85019

Filed Aug. 12, 1974, Ser. No. 496,567

Int. Cl.² B26D 7/06

U.S. Cl. 83—145 **5 Claims**



1. An apparatus for punching an elongated multiflanged workpiece comprising:

a. a support plate;

b. die set means carried on said support plate for punching an elongated multiflanged workpiece when that workpiece is positioned therein, said die set means including a fixture die means having a workpiece supporting and movement path formed therethrough and cutting die means reciprocally movable in a path transverse to the workpiece supporting and movement path formed through the fixture die means;

c. the fixture die means of said die set means having a pair of support dies spaced apart with respect to each other to form a gap therebetween into which a portion of the cutting die means of said die set means is reciprocally movable, said pair of support dies each having an upper surface upon which portions of the multiflanged workpiece are slidingly movable in a path transverse to the gap between said pair of support dies, each of the upper surfaces of said pair of support dies having a horizontally extending vertical channel formed therein in which a portion of the multiflanged workpiece is slidingly movable in a path transverse to the gap between said pair of support dies;

d. the fixture die means of said die set means also having a backup die spaced from said pair of support dies to provide a horizontally extending vertical passage therebetween in which a portion of the multiflanged workpiece is slidingly movable in a path transverse to the gap between said pair of support dies, said backup die having a vertical channel formed therein which aligns with the gap between said pair of support dies and into which a portion of the cutting die means of said die set means is reciprocally movable;

e. input channel means on which the elongated multiflanged workpiece is slidably movable, said input channel means adjacent one side of said support plate and in workpiece directing alignment with the workpiece supporting and movement path formed through the fixture die means of said die set means;

f. output channel means on which the elongated multiflanged workpiece is slidably movable, said output channel means adjacent the opposite side of said support plate and in workpiece receiving alignment with the workpiece supporting and movement path formed through the fixture die means of said die set means; and

g. punch press means coupled to said die set means for reciprocally moving the cutting die means thereof.

3,938,414

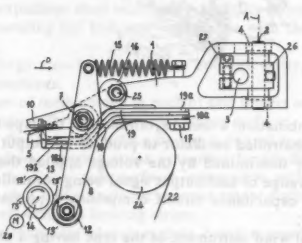
SCISSOR-TYPE SHEAR FOR LOOM

Pierre Remond, Bourgoin-Jallieu, France, assignor to Saurer-Diederichs S.A., Bourgoin-Jallieu, France

Filed Mar. 27, 1975, Ser. No. 562,857

Int. Cl.² B26D 5/00

U.S. Cl. 83—368 **10 Claims**



1. A device for cutting a fabric lengthwise between a pair of warp filaments as it is advanced continuously, said device comprising:

a support carrying a first blade;

a pivot defining a vertical pivot axis for said support;

guide means including at least one feeler engageable with at least one of said pair of warp filaments for pivoting said support about said axis and thereby positioning said blade between said filaments;

a second blade pivoted on said support; and

means for oscillating said second blade relative to said first blade for shearing said fabric between said pair of filaments.

3,938,415

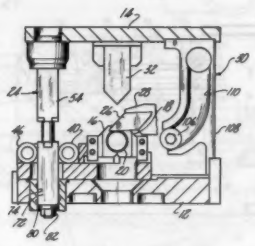
TUBE CUTOFF APPARATUS

Alexander Borzym, 6841 Oakman, Dearborn, Mich. 48126

Filed Dec. 19, 1973, Ser. No. 426,087

Int. Cl.² B26D 5/42

U.S. Cl. 83—385 **9 Claims**



1. Apparatus for severing a tubular workpiece comprising: a base for receiving the workpiece; a ram assembly reciprocable vertically and cyclically displaceable relative to the base; a severing blade carried by said ram assembly; workpiece clamping means on said base; actuator means operatively connected between said base and ram assembly for causing said clamping means to clamp the workpiece during a cycle of ram assembly displacement; slide means on said base carrying a slotting blade and having a work stroke in the plane of the severing blade and transversely of the workpiece for slotting an upper wall of the workpiece; cam follower means on said slide means; and, a vertically depending cam carried by said ram and engaging said follower means and being so configured to advance said slide means toward said workpiece only during vertical displacement of the ram assembly away from the workpiece, said workpiece clamping means comprising a pair of complemental die jaws, first and second slide means carrying respective jaws for sliding displacement relative to the base, and first and second cam follower means on respective slide means; the actuator means comprising a two-part lost motion cam assembly operatively interconnected between the ram and base and engageable with the first and second cam follower means to close the jaws on the workpiece, and stop means on the base and engaging one of the slide means when the die jaws are closed to react against force produced by the work stroke of the slotting blade and transmitted to the one slide means via the die jaw, the other slide means, the cam follower means, and cam assembly.

3,938,416

PUNCHING OR NIBBLING PRESSES HAVING A TURRET

Philippe L. Beauplat, 44 rue de Montmorency, 95230 Solsy-sous-Montmorency, France

Filed Sept. 5, 1974, Ser. No. 503,264

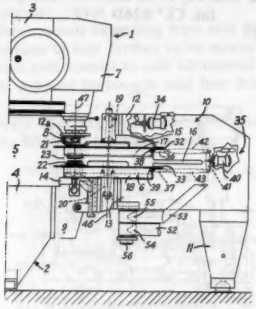
Claims priority, application France, Sept. 12, 1973, 73.32803

Int. Cl.² B26D 5/08

U.S. Cl. 83—552 **5 Claims**

1. A punch press apparatus comprising a punch press unit and a tool exchange unit fixedly connected to said punch press unit for operation therewith; said punch press unit having a C-shaped frame, an anvil supported by said frame, and a ram supported by said frame in opposite spaced-apart relation to the anvil and moveable relative thereto along a given path; said tool exchange unit having a C-shaped frame disposed in laterally spaced relation to the C-shaped frame of the punch press unit, the openings of said C-shaped frames being in generally facing relation to each other, said tool exchange unit

having turret means supported by the frame of such unit for rotation relative thereto about a fixed axis to selectively position punch and die sets carried by the turret means into registry with said ram and anvil.



3,938,417

NOISE-SUPPRESSED CIRCULAR SAW BLADE

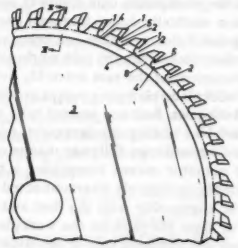
Hans Ludvig Nedsten, Trollhattan, Sweden, assignor to AB Stridsberg & Biorck, Trollhattan, Sweden

Filed Nov. 14, 1974, Ser. No. 523,983

Claims priority, application Sweden, Nov. 28, 1973, 73160509

Int. Cl.² B27B *33/08*

U.S. Cl. 83—835 **4 Claims**



1. An improved noise-suppressed circular saw blade comprising teeth welded to said blade, gaps formed between subsequent ones of said teeth, the bottom portion of said gaps extending to a point closer to the saw blade centre than the radially inner end of said teeth, the improvement comprising a circumferential zone in the core disc of said saw blade, said zone positioned radially inside said teeth and having a thickness less than the thickness of said core disc and wherein a groove is formed in at least one of the surfaces of said saw blade, the bottom portion of said groove forming said zone and wherein the longitudinal medium line of said groove is essentially tangent to said bottom portion of said teeth gaps.

3,938,418

CIRCULAR SAW BLADE

Roderich Orendi, Sondelfingen, Germany, assignor to Gustav Wagner Maschinenfabrik, Reutlinger, Germany

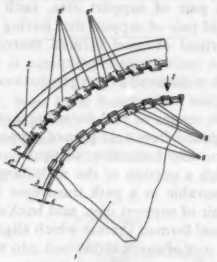
Filed Dec. 6, 1974, Ser. No. 530,370

Claims priority, application Germany, Dec. 14, 1973, 2362319

Int. Cl.² B27B *33/08*, *33/12*

U.S. Cl. 83—839 **6 Claims**

1. In a circular saw blade having a center disk with a circumference and a plurality of teeth segments with radially inwardly facing edges secured to said circumference of the center disk, the improvement comprising two rows of first and second lands extending along the circumference of the center disk and two similar rows of third and fourth lands extending along the inwardly facing edges of said teeth segments, gaps between adjacent lands in each of the rows, whereby the lands



are circumferentially spaced from each other, said first lands axially registering with the gaps between the second lands and vice versa, said third lands axially registering with the gaps between the fourth lands and vice versa, said first and second lands radially registering along common interfaces with the third and fourth lands, and welding seams between the lands on the center disk and the lands on the teeth segments.

3,938,419

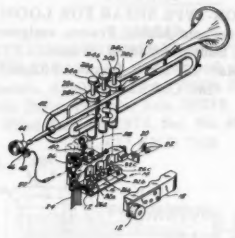
ELECTRONIC MUSICAL INSTRUMENT

David De Rosa, Box 193, West Sand Lake, N.Y. 12196

Filed May 20, 1974, Ser. No. 471,288

Int. Cl.² G10H *1/00*, *5/00*

U.S. Cl. 84—1.14 **9 Claims**



1. In combination: a music synthesizer of the type including a voltage controlled oscillator to produce an output signal of a frequency determined by the voltage applied thereto, the frequency range of said output signal being controlled by the value of a capacitance circuit comprising a portion of said synthesizer;

a musical wind instrument of the type having a plurality of valves, the opening and closing of which is normally used to control the frequency of the note produced by said instrument when said instrument is played in a conventional manner; a voltage source connected to said synthesizer; means connected to said voltage source and said valves to control the voltage applied to said oscillator in response to the opening and closing of said valves;

a plurality of capacitance circuits, the value of each of said circuits being such as to produce a different frequency range for said synthesizer when interconnected to form said portion of said synthesizer; and

multiposition switch means interconnecting said plurality of capacitance circuits with said synthesizer whereby in each position of said switch a different capacitance cir-

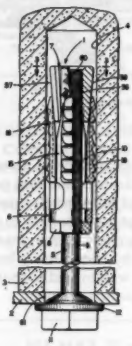
cuit is interconnected with said synthesizer to comprise said portion of said synthesizer.

3,938,420

MINE ROOF BOLT ANCHOR CONSTRUCTION

Wayne A. Draa, Alliance, Ohio, assignor to Gottschall Tool & Die, Inc., Salem, Ohio

Filed June 27, 1974, Ser. No. 483,790
Int. Cl.² F16B 13/06
U.S. Cl. 85—76 11 Claims



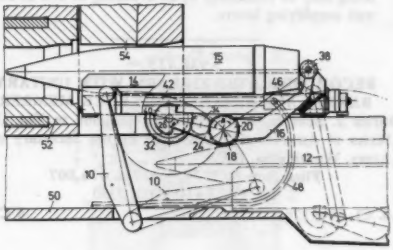
1. Mine roof bolt anchor construction including:
a. a bolt having a threaded shank portion;
b. a camming plug threadably engaged with said bolt for advancement along the threaded shank portion;
c. an expansion shell mounted on the bolt;
d. the expansion shell including a plurality of metal fingers surrounding the bolt and engageable with the camming plug;
e. the fingers each having a free end and outer, inner and side surfaces;
f. a series of teeth coined in each of said fingers and projecting outwardly from the outer finger surface;
g. each finger inner surface having a pair of spaced generally planar bearing strips extending longitudinally adjacent the finger side surfaces engageable with the camming plug, and a single rectangular planar surface extending between said bearing strips;
h. the rectangular planar surface being tapered from the finger free end outwardly away from the bearing strips, and the teeth being coined from finger material displaced in forming said tapered planar surface, with the rectangular planar surface constituting a smooth back surface for the series of teeth and forming the entire area between the spaced bearing strips;
i. the majority of the teeth include major planar facets extending outwardly downwardly with respect to the outer finger surface and minor planar facets extending outwardly upwardly with respect to the outer finger surface;
j. and tooth crests being formed by the junctions of said major and minor planar facets and extending transversely with respect to the shell fingers.

3,938,421

RAMMER FOR PROJECTILES

Adolf Nordmann, Hochdahl, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed Apr. 11, 1974, Ser. No. 460,138
Claims priority, application Germany, Apr. 21, 1973, 2320398
Int. Cl.² F41F 17/16
U.S. Cl. 89—47 5 Claims



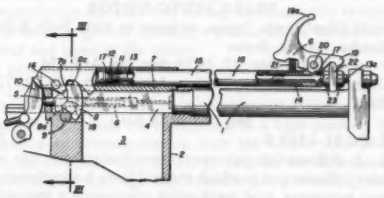
1. A shell loading tray for the loading chamber of a gun having a barrel axially aligned with said loading tray swingably mounted behind said chamber for carrying a shell into a position in which said shell is axially aligned with said barrel;
a pivot mounted on said loading tray for circular movement relative thereto about an axis offset from the axis of said pivot;
a ramming lever mounted on said pivot for circular movement about the axis of said pivot, said lever having a finger engaging behind said shell for displacing same in free flight through said chamber;
guide means for said pivot and said lever imparting substantially linear movement to said finger parallel to the axis of said barrel upon rotation of said pivot and said lever; and
drive means for swinging said lever about said pivot and for swinging said pivot about said axis offset therefrom to propel said shell through said chamber.

3,938,422

AUTOMATIC FIREARMS HAVING A BOLT ASSISTED BY AN ADDITIONAL MASS

Paul E. Tellie, 20, rue Bergson, 42000 St. Etienne, France

Filed May 17, 1974, Ser. No. 470,839
Claims priority, application France, June 1, 1973, 73.19974
Int. Cl.² F41D 5/02, 11/00
U.S. Cl. 89—169 11 Claims



1. An automatic firearm comprising:
a bolt which recoils upon each slot against the action of return means,
an additional mass,
an amplifying lever pivotally mounted on said bolt by a transverse pin, said amplifying lever having a resting surface adapted to come into contact with a fixed stop surface at the start of the recoil stroke of the bolt,

said additional mass being mounted for sliding parallel to said bolt and being fastened to said bolt by said amplifying lever, and

said amplifying lever, in the direction of the axis of firing, being symmetrical with respect to a central plane perpendicular to its axis of pivot and being in the shape of an H the horizontal cross bar of which is said transverse pin and the two uprights of which are two symmetrical parallel unit amplifying levers each capable of assuring a correct fastening of the bolt and the additional mass so that firing may be continued upon breaking of one of the two unit amplifying levers.

3,938,423

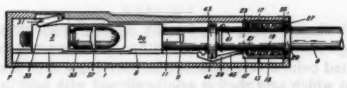
RECOIL OPERATED FIREARM WITH UNITARY BARREL AND BREECH BOLT LOCK MEMBER

Charles J. Schertz, Bettendorf, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 6, 1974, Ser. No. 476,807

Int. Cl.² F41D *1/02, 3/00*

U.S. Cl. 89—176 **6 Claims**



1. A short-recoil-operated automatic firearm comprising:

a receiver or frame;

a barrel slidably mounted on said receiver for reciprocation between a forward position and a rearward position;

a breech bolt slidably mounted on said receiver for reciprocation between a forward position, a rearward ejecting and loading position, and an intermediate position; and

a single lock element mounted on said barrel and alternately engageable with portions of said breech bolt and said receiver for (1) locking said breech bolt to said barrel in said forward positions while permitting the locked barrel and breech bolt to recoil on firing, and (2) locking said barrel to said receiver in said rearward barrel position while releasing said breech bolt to continue its recoil motion; said single lock element being a lever pivoted intermediate its ends on said barrel and comprising a forward end engageable with a rearwardly-facing abutment on said receiver and a rear end with a lateral locking notch engageable with a complemental lateral locking projection on said breech bolt.

3,938,424

BRAKE SERVO-MOTOR

Atsushi Ohmi, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

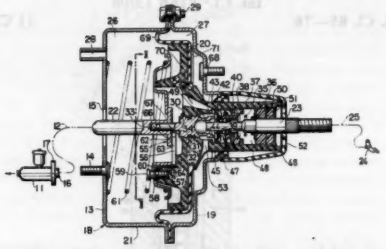
Filed Nov. 27, 1973, Ser. No. 419,274

Claims priority, application Japan, Nov. 29, 1972, 47-137202

Int. Cl.² F15B *9/10*

U.S. Cl. 91—369 B **5 Claims**

1. A differential servomotor mechanism for use with a master cylinder and in which manual force is supplemented by power assistance, said mechanism comprising a housing **18**, a pressure responsive wall **20, 69** in said housing, valve means **42, 43, 44, 45, 30** associated with said wall and being movable relative thereto to control the differential pressure acting on said wall, an output member **55,22** operatively connectable to the master cylinder **11** for delivering pressurized braking hydraulic fluid, restoring means including a retainer **58** and a resilient element **61** for normally urging said wall toward its rest position, said retainer and said wall being permitted a slight axial relative movement therebetween, reaction means **56** interposed between said output member and said wall and having first **57**, second **64**, third **63**, and fourth **66** points spaced radially from outward to inward direction, said first, second, and third points being continuously held in contact with said retainer, wall and output member respectively, said fourth point engaging said valve means when braking is actually performed, said wall being initially movable to transmit force through said second point in association with said resilient element to said output member without affecting said



valve means, said resilient element therely normally acting on said reaction means through said first point thereof and being distorted during initial movement of said wall in response to resistance of said output member to engage said reaction means with said valve means through said fourth point of said reaction means thereby transmitting both movements of said valve means and said wall to said output member through said third point of said reaction member.

3,938,425

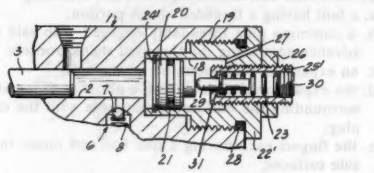
PUMP STROKE ADJUSTMENT DEVICE

Kenneth K. Kroffke, Cleveland, Ohio, assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Apr. 15, 1974, Ser. No. 460,907

Int. Cl.² F01B *3/1/14*

U.S. Cl. 92—60.5 **2 Claims**



1. In an adjustable positive displacement pump for discharging a selectively variable volume of fluid and having a pump body with a cylindrical wall forming a bore therein, a fluid displacement piston in said bore movable back and forth between a retracted position and an advanced position, a fluid inlet port and a fluid outlet port communicating with said bore, means including a control piston forming a fluid expansion chamber in communication with said bore adjacent said fluid outlet port, said control piston being movable to vary the volume of said fluid expansion chamber, externally adjustable abutment means engageable with said control piston for selectively limiting the movement thereof in a volume-increasing direction, means biasing said control piston in a volume-decreasing direction, check valve means in communication with said fluid outlet port for permitting fluid flow therethrough only when the fluid pressure in said bore exceeds a predetermined minimum outlet pressure, said control piston biasing means being operative to exert a force on said control piston which is less than said predetermined minimum outlet pressure whereby fluid will flow through said outlet port only

after said control piston has engaged said abutment means, with the volume of fluid flow through said outlet port being determined by the effective volume of said expansion chamber in dependence upon the adjustment setting of said abutment means, wherein the improvement comprises the relationship between said inlet port and said fluid displacement piston whereby communication between said inlet port and said bore is established by said fluid displacement piston only when the latter is in its retracted position, whereby a vacuum condition is produced in said bore and in said expansion chamber as said displacement piston moves from its advanced to its retracted position to subject the control piston to a vacuum-created bias in a volume-decreasing direction to evacuate said expansion chamber and to draw fluid into said bore after said displacement piston has moved to its retracted position, and communication between said inlet port and said bore is blocked by said fluid displacement piston when the latter moves from its retracted position toward its advanced position.

3,938,426

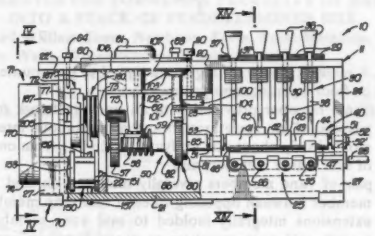
WATER POWERED DRIVE FOR AUTOMATIC CONTROLLERS

Edwin J. Hunter, Riverside, Calif., assignor to The Toro Company, San Marcos, Calif.

Division of Ser. No. 190,528, Oct. 19, 1971. This application Nov. 23, 1973, Ser. No. 418,309

Int. Cl.[2] F01B *9/00, 31/00, 25/06*

U.S. Cl. 92—140 **8 Claims**



1. A drive means for operating an automatic controller apparatus having a power input shaft, comprising:

water powered means for receiving water under varying pressure from a source thereof and having a member driven by the force of said water thereon, said water powered means including means for supplying water to and exhausting water therefrom;

power transmission means for driving said controller apparatus shaft in response to movement of said member under the action of said water; and

speed control means for automatically controlling the speed of driving of said controller apparatus shaft under the force of said water powered means acting through said power transmission means to a predetermined rate, said speed control means including an escapement mechanism having a shaft having a maximum speed, means for driving said escapement mechanism shaft from said power transmission means responsive to the speed thereof, and control means movable in response to speed of said transmission means in excess of the maximum speed determined by the escapement mechanism.

3,938,427

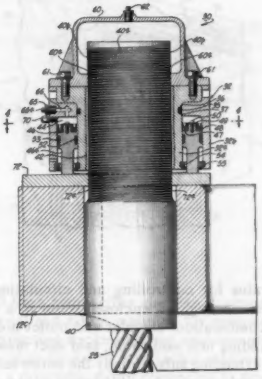
PERCUSSION HAMMER

Henry G. Warrington, Delray Beach, Fla., assignor to Vulcan Iron Works, Inc., Chattanooga, Tenn.

Continuation-in-part of Ser. No. 273,164, July 19, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 441,027

Int. Cl.[2] E21B *19/00;* **E01B** *31/00*

U.S. Cl. 92—107 **9 Claims**



1. A percussion hammer for driving piles and the like comprising:

a housing having a cylinder portion and a lower portion;

a ram slidably mounted within said housing;

piston means slidably received within said housing and connected to reciprocate said ram;

a plurality of tie members interconnecting said cylinder portion and said lower portion, each of said tie members terminating in an externally threaded portion; and

a cable tensioning jack mounted on a portion of said housing for tensioning each of said tie members relative to said cylinder portion, each of said cable tensioning jacks including:

a jack body having an internally threaded central opening threaded on the externally threaded portions of its respective tie member and having concentrically therewith an annular groove defining a jack cylinder closed at one end and open at the other;

an annular jack piston slidably received within said jack cylinder and including a portion projectable through the open end thereof bearing relative to said cylinder portion;

pressurizing means for connection to a high pressure fluid source in communication with the closed end of said cylinder above said piston to provide for admission of pressurized fluid into said cylinder and preventing escape of fluid therefrom; and

a manual jack mounted on each of said tie members, each manual jack including a jack plate having a central opening, said externally threaded portions of each of said tie members being threaded into said central opening of one of said jack plates, said jack plates also having a plurality of jack screws in abutting engagement with said jack plate and said housing portion and concentrically positioned relative to said central opening of the respective jack plate radially outwardly of the respective cable tensioning jack.

3,938,428

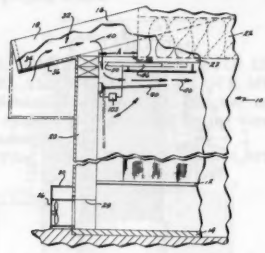
ANIMAL ENCLOSURE WITH PRESSURE CONTROLLED VENTILATION INLET AND DEFLECTION MEANS

Robert L. Van Huis, Zeeland, Mich., assignor to U. S. Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 308,692, Nov. 22, 1972, Pat. No. 3,808,960. This application Mar. 11, 1974, Ser. No. 449,625

Int. Cl.[2] B64D *13/00*; F24F *13/06*

U.S. Cl. 98—1.5 12 Claims



1. Apparatus for controlling and circulating the flow of ventilating air through an enclosed room in a building comprising, in combination: air inlet and outlet means from outside said building into said room, said inlet means comprising an opening extending substantially the entire length of at least one side of said room; exhaust means causing air outside the building to flow into said room through said inlet means and out said outlet means; valve means associated with said inlet means and operable between a generally open and generally closed position to admit or prevent flow through said inlet means, said valve means also being operable to positions intermediate said open and closed positions; deflection means adjustable relative said air inlet means to cause even distribution of air flowing through said inlet means through said room; sensing means for sensing the pressure differential between the ambient pressure outside said building and the pressure within said room; and control means responsive to said sensing means for actuating said valve means and deflection means to maintain a preselected pressure differential, said control means adjusting said deflection means in cooperative relationship to the position of said valve means to provide continuous and even distribution of air circulation through said room.

3,938,429

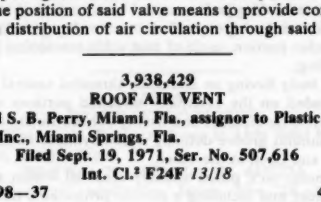
ROOF AIR VENT

Raymond S. B. Perry, Miami, Fla., assignor to Plastic Components, Inc., Miami Springs, Fla.

Filed Sept. 19, 1971, Ser. No. 507,616

Int. Cl.[2] F24F *13/18*

U.S. Cl. 98—37 4 Claims



1. A roof air vent, comprising, in combination:

a. rails mountable about an opening in a roof for forming a support bracket; and

b. a perforated panel arrangeable in the rails for covering the opening, the rails including a pair of side rail forming, parallel tracks, each of the tracks having a web and a pair of spaced, parallel legs extending codirectionally from the web, with one of the legs being longer than the other of the legs for providing a surface attachable to a building structure, the rails further including a pair of end rails similar in construction to the side rail forming tracks and arrangeable across the ends thereof, the panel consisting of a perforated planar median portion bracketed by a pair of oppositely directed substantially planar parallel flanges connected to the median portion in offset relationship thereto by transition portions.

3,938,430

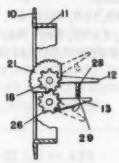
AIR VENTS

Ronald N. Koppang, 9537 Pitch Pine Drive, Shreveport, La. 71108

Continuation of Ser. No. 254,380, May 18, 1972, abandoned. This application Feb. 1, 1974, Ser. No. 438,564

Int. Cl.[2] F24F *13/06*

U.S. Cl. 98—103 8 Claims



1. A molded plastic air register adapted to be mounted in a wall or floor opening, comprising:

a frame member provided with an open gridwork for the passage of air therethrough and a continuous integrally molded strip about said gridwork extending from one side of said frame member, and

a pair of vane members pivotally mounted on said frame member between opposing sides of said strip member by extensions integrally molded to said vane members to permit said vane members to move between positions providing a different restriction to the flow of air through said gridwork, said vane members including actuating means integrally molded therewith for moving said vane members between said positions, said actuating means including a gear integrally molded to the same end of each of said vane members, and an actuator integrally molded with one of said gears and extending into said gridwork to be actuated from the side of said frame opposite to that on which the vane members are mounted.

3,938,431

ELECTRIC GRILL APPLIANCE

Alfred M. Potvin, 155 Denavare St., St. Lambert, Quebec, Canada

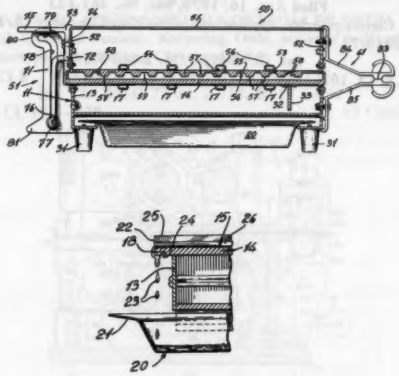
Filed Dec. 6, 1974, Ser. No. 530,073

Int. Cl.[2] A47J *37/06*

U.S. Cl. 99—425 10 Claims

1. An electric grill appliance comprising a main body having a bottom wall, opposed side walls and a top horizontal plate of heat conductive material, said top plate having an outer cooking surface and an undersurface facing said bottom wall, at least one resistive heating element secured directly to said undersurface for heating said top plate, said body being supported above a horizontal plane by support means, a container removably secured under said bottom wall and having a liquid collecting flange extending outside one of said opposed side

walls, a slot formed along a portion of an outside edge of said top plate extending beyond an opposed side wall, said slot being located in said undersurface adjacent the outer edge of said extension whereby hot liquid flowing on and about said



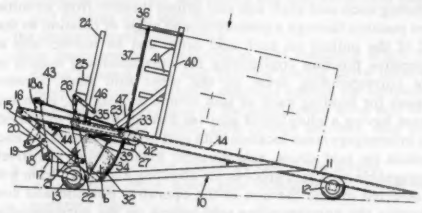
outer edge will be caused to flow to the outer edge undersurface and be arrested to collect in droplets and fall by gravity onto said collecting flange and directed into said container under said bottom wall of said main body.

3,938,432

APPARATUS FOR FORMING A PLURALITY OF BALES INTO A STACK OF PREDETERMINED SIZE

Richard William Jones, Newhouse Farm, Saint Michaels, Tenbury Wells, Worcestershire, England

Filed Apr. 29, 1974, Ser. No. 465,338
Int. Cl.² B65B *13/02*; B65G *57/30*
U.S. Cl. 100—7 **9 Claims**



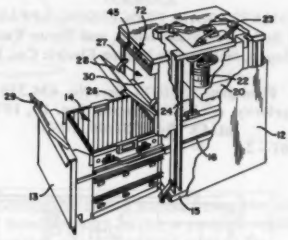
1. Apparatus for forming a quantity of bales into a stack of predetermined size comprising in combination a support, a slideway on the support, a bale receiving platform pivotally mounted on the support between a raised bale discharge position in alignment with the slideway and a position in alignment with a baling machine for receiving a bale therefrom means for automatically raising said bale receiving platform to the bale discharge position each time a bale is received thereby, catch means on the support in position to engage the bale at the bale discharge position for retaining a bale in the position to which it is raised by the bale receiving platform into engagement therewith until it is raised further by a successive bale being raised by the bale receiving platform, means for automatically lowering the platform after the bale is engaged by the catch means for receiving a further bale, means for automatically moving laterally onto the slideway at least one vertical row of bales in response to the raising of a predetermined number of bales by the bale receiving platform and to permit further vertical rows of bales to be formed by the bale receiving platform, means for automatically drawing a binding element in response to the completion of a predetermined number of vertical rows and for automatically securing the binding element around the predetermined number of rows to form a stack after said predetermined number of rows have been moved onto the slideway.

3,938,433

TRASH COMPACTOR WITH CLOCK TIMER CONTROL

Charles J. Borum, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Sept. 17, 1974, Ser. No. 506,696
Int. Cl.² B30B *15/14*
U.S. Cl. 100—51 **3 Claims**



1. A control for a compacting machine having a receptacle for trash material and a ram mounted for compacting movement in a compacting stroke entering said receptacle and an opposite retracting stroke to a retracted starting position, a power supply, a reversible motor connected to drive said ram, a manually initiated cycle control circuit for said motor including a directional switch connected to cause forward and reverse operation of said motor in a cycle corresponding to the compacting and retracting strokes of said ram and a starting switch for operatively connecting said directional switch with said power supply;

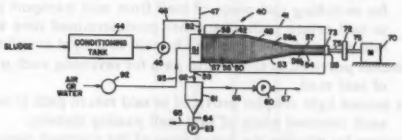
the improvement comprising a timer unit having control means connected in said circuit to start said motor and to operate said ram independent of manual initiation through a compacting stroke at a predetermined time, to stop said ram upon completion of the compacting stroke, and to delay the retracting stroke of said ram for a substantial period of time.

3,938,434

SLUDGE DEWATERING

Clyde H. Cox, 12723 Gaylawood Drive, Houston, Tex. 77066

Continuation-in-part of Ser. No. 342,772, March 19, 1973, abandoned. This application June 10, 1974, Ser. No. 477,797
Int. Cl.² B30B *9/14*
U.S. Cl. 100—117 **48 Claims**



1. A device for dewatering sludge, including in combination:

a filter-dewatering shell having an initial portion, a succeeding portion and a terminal portion, each comprising means for exit of fluid and retention of solid particles,

filtrate collection means outside said shell and spaced therefrom for collecting filtrate,

central shaft means along the axis of said filter-dewatering shell, the distance between said shaft means and said shell

being a constant maximum distance in said initial portion and decreasing in said succeeding portion to a minimum in said terminal portion,

wiping, compressing, and filter-cake-discharging means secured to said shaft means and wiping the inner surfaces of said shell,

power means for rotating said shaft means,

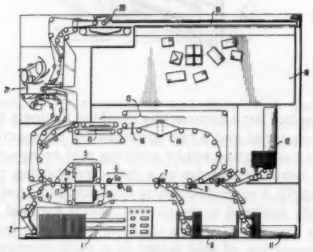
nozzle means on the outer edge of said wiping, compressing, and filter-cake-discharging means facing said shell, and

fluid supply means for supplying said nozzle means with fluid for cleaning out said means for exit.

3,938,435
AUTOMATIC MAIL PROCESSING APPARATUS

Kazuyoshi Suda; Tomoyuki Isono, and Teruo Yashima, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1974, Ser. No. 434,335
Claims priority, application Japan, Jan. 19, 1973, 48-9074
Int. Cl.² B41F *21/00, 10/00*
U.S. Cl. 101—2 **7 Claims**



1. A mail processing apparatus comprising:

means defining a mail transport path along which said mail is transported;

means for feeding said mail piece-by-piece to said mail transport path;

a pair of postage stamp detectors provided on both sides of said mail transport path;

a first light coupler provided in said mail transport path upstream of said postage stamp detectors and adapted to sense each piece of said mail passing thereby;

a pair of cancelers provided on both sides of said mail transport path downstream of said postage stamp detectors, each of said cancelers being adapted to be actuated at a predetermined time after each piece of said mail is sensed by said first light coupler;

means defining a return path;

means responsive to a failure of said postage stamp detectors to detect a postage stamp on each piece of said mail for switching said piece of mail from said transport path to said return path at another predetermined time after said piece of mail is sensed by said first light coupler;

means provided in said return path for reversing each piece of said mail;

a second light coupler provided in said return path to sense each reversed piece of said mail passing thereby;

means for aligning the lower sides of the reversed pieces of said mail with each other;

means for switching said reversed mail in said return path back to said mail transport path;

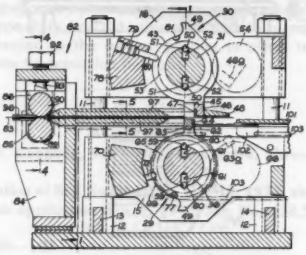
means for controlling the operation of said feeding means in response to each piece of said mail being sensed by said second light coupler; and

means responsive to a failure of said postage stamp detectors to detect a postage stamp on the reversed piece of said mail for removing said piece of mail from said mail transport path.

3,938,436
SELECTIVE EMBOSSING PRESS WITH DRUM STOP MEANS

Eric Douglas Woodhouse, East Kilbride, Scotland, assignor to Hilti Aktiengesellschaft, Liechtenstein

Filed Apr. 16, 1974, Ser. No. 461,423
Claims priority, application United Kingdom, Apr. 18, 1973, 18610/73
Int. Cl.² B41J *3/38*; B44B *5/00*
U.S. Cl. 101—18 **8 Claims**



1. An embossing press comprising a pair of oppositely disposed embossing rolls, each said embossing roll comprising a shaft, a plurality of indicia drums mounted on said shaft with each said drum mounted opposite a corresponding said drum on the other said shaft, means for releasably coupling said indicia drums to said shaft for rotation of said drums with said shaft, said means permitting the uncoupling of said drums and said shaft on the application of a sufficient force, upstanding indicia mounted on and spaced angularly apart on the outer periphery of said drums of one said shaft, and complementary indented indicia mounted on and spaced angularly apart on the outer periphery of said drums of the other said shaft, shaft drive means operatively connected to each said shaft for rotating each said shaft and said drums thereon from an initial rest position through a predetermined angle of rotation so that all of the indicia on each said drum can be moved into an operative position confronting the corresponding indicia on the corresponding drum on the other said shaft, arrestor means for holding each of said drums in position, each said drum having a plurality of grooves formed therein to provide an interengagement location with said arrestor means for each indicia on said drum, said arrestor means being selectively engageable with said grooves for arresting each said drum with a selected indicia thereon in the operative position and confronting the corresponding said indicia on the corresponding said drum on the other said shaft, pressure means for urging the oppositely disposed embossing rolls toward one another under pressure for embossing with said indicia located in the operative positions, severing means operatively connected to said pressure means to permit individual sections of material to be severed from a continuous length of sheet material fed to the press for embossing so that individual embossed elements or plates can be produced after the embossment of the individual sections, said severing means comprising a pair of shearing bars, one of said shearing bars being mounted on one of said shafts and the other said shearing bar being mounted on the other said shaft so that said shearing bars are displaceable between their operative positions wherein they cooperate with one another, when the shaft are rotated forwardly from their initial positions, so that they will not obstruct the embossing operation and are returned to their operative positions upon return of said shaft to the initial rest position, bearings disconnectedly mounted on each said shaft for rotation therewith so that relative rotation between said bearings and said shaft can be accomplished, each said shearing bar is connected to said bearings for mounting said shearing baroon said

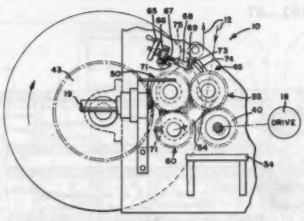
shaft with which it is associated, and stop means arranged for defining an inoperative position of each said shearing bar.

3,938,437

VARIABLE SPEED UNWIND CONTROLLER DRUM

Dinesh Gulabrai Punater, Kettering, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Feb. 27, 1974, Ser. No. 446,138
Int. Cl.² B65H 77/00, 23/18; B41F 13/02
U.S. Cl. 101—228 12 Claims



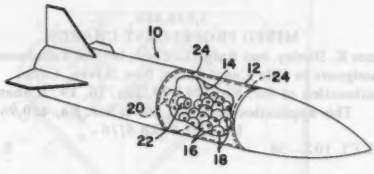
1. In a web infeed system for a rotary printing press having
a printing couple including a pair of cylinders adapted to print the web under pressure and drive the web through a nip formed by said cylinders,
drive means for driving said printing couple,
a web supply roll,
means supporting said supply roll for paying out the web on demand related to the requirements of said printing couple, and
a metering drum intermediate said web supply and said printing couple for unwinding the web from said supply and feeding it to said nip,
the improvement comprising:
drive train means connected to said metering drum with direct gearing from said printing couple drive means at independently selectable different speeds the outputs of which differ in relation to the input speed from said drive means generally within .05% of one another, said drive train means including:
a. an imput drive gear driven by said drive means,
b. a metering drum drive gear connected to rotate said metering drum,
c. one of said input and metering drum drive gears being a first drive gear and the other being a second drive gear,
d. a first idler set having at least two gears and being mounted adjacent said first drive gear with a first gear of said first idler set meshed with said first drive gear,
e. a second idler set having at least two gears and being mounted with a first gear thereof meshed with a second gear of said first idler set,
f. a third idler set having at least two gears and being mounted with a first gear thereof meshed with said second gear of said first idler set, said third idler set being free of driving contact with said second idler set,
g. means mounting said second drive gear adjacent the second gears of said second and third idler sets,
h. means for alternatively meshing said second drive gear with one or the other of the second gears of said second and third idler sets, and
i. one of said first and second idler sets providing a speed increasing ratio and the other a speed decreasing ratio to provide a net speed change which is the product of their ratios and is an increase or decrease of generally less than 0.5%.

3,938,438

PRESSURE-ARMED EXPLOSIVE APPARATUS

Matthew E. Anderson, Ontario; Stephen L. Redmond, China Lake, both of Calif.; John W. Horky, Naperville, and Leo V. Krolak, Northbrook, both of Ill., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1971, Ser. No. 133,364
Int. Cl.² F42B 25/16; F42C 15/12
U.S. Cl. 102—7.2 5 Claims



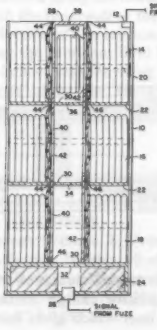
1. An air-droppable sealed warhead cannister containing a plurality of bomblets each having a pressure sensitive explosive fuze provided with a fluid inlet port:
means including a power source connected to the cannister for pressurizing said cannister in flight with a fluid at a predetermined event by admitting fluid pressure through said port to activate the fuzes to commit-to-arm condition;
means for fragmenting said cannister at a second predetermined event to disperse said bomblets into the atmosphere, and exhaust said pressure in the fuze to the atmosphere through said inlet port;
means for advancing the fuzes to an armed position when said pressure is exhausted;
whereby all of said fuzes can be committed-to-arm simultaneously after the cannister has reached a safe distance from the launching platform, the fuzes being advanced to armed conditions when said cannister is fragmented and the bomblets dispersed.

3,938,439

CHARGE DEPLOYMENT DEVICE

John E. Walton, Camillus, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 21, 1974, Ser. No. 481,950
Int. Cl.² F42B 25/16
U.S. Cl. 102—7.2 3 Claims



1. A device for deploying multi-tiered charged rounds into radial patterns expanding at different rates therefrom, said device comprising: a sectional enclosing case; stops in said

device to separate each tier of charged rounds from a succeeding tier; a gas generator associated with said case for producing gas; a tube disposed on said generator, said tube being provided with a plurality of lateral openings spaced longitudinally of said tube; a plurality of cylindrical resilient diaphragms, each diaphragm being attached to the tube at points enclosing a horizontal set of lateral tube openings and a plurality of internal restrictions in said tube that provide progressively sized horizontal orifices for developing the controlled forces to deploy said tiered rounds into radially expanding patterns.

3,938,440

MIXED PROPELLANT CHARGE

James K. Dooley, and Ralph L. Cook, both of Tallahassee, Fla., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 324,699, Jan. 18, 1973, abandoned. This application Mar. 14, 1974, Ser. No. 450,961

Int. Cl.² F42B *5/16*

U.S. Cl. 102—38 **8 Claims**

1. A propellant charge for use in a cartridge, said propellant charge comprising a first constituent of compacted nitrocellulose base smokeless powder and a second constituent of loose granular nitrocellulose base smokeless powder, said propellant charge having a maximum packing density which is greater than about 1.0 gm/cc.

3,938,441

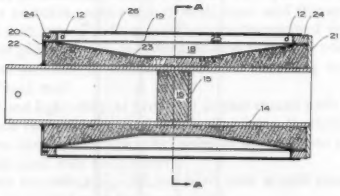
TERRAIN CLEARING DEVICE AND METHOD

Robert G. S. Sewell, and Carl C. Halsey, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1971, Ser. No. 168,359

Int. Cl.² F42B *13/48*

U.S. Cl. 102—67 **3 Claims**



1. Apparatus for terrain clearance which comprises:

a. a shaped explosive charge contained around its outer surface by a liner which gives the desired shape to said charge;

b. a continuous rod bundle which can be collapsed and expanded and which is fabricated from ribbon shaped rods plug welded together at alternate ends, said rod bundle being disposed in its collapsed configuration around the periphery of said shaped explosive charge in a tube, there being air space between the interior of said tube and said form which gives the desired shape to said charge; and

c. means for detonating said shaped explosive charge.

3,938,442

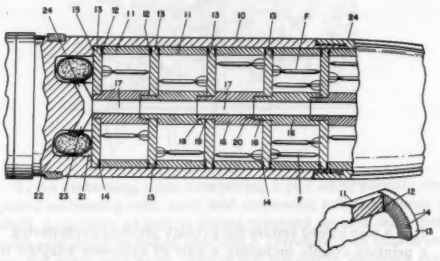
SERRATED SUPPORTING KEYING SYSTEM FOR A BEEHIVE PROJECTILE

Vincent J. Donadio, Pompton Plains, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 27, 1971, Ser. No. 183,888

Int. Cl.² F42B *13/48*

U.S. Cl. 102—67 **13 Claims**



1. In combination with a spin-stabilized projectile including a divided payload; a keying system for said payload comprising a series of axially aligned spacing members, each said spacing member housing a portion of said payload, a series of axially aligned supporting members disposed, one each, between a pair of said spacing members, engraving means on at least one end of each said supporting member, at least one end with engraving means being in contact with each spacer, and means for locking said supporting members to the projectile, whereby setback force generated by firing of said projectile causes said supporting members to engrave the ends of said spacing members and interlock said divided payload against rotational movement during projectile spin.

3,938,443

LOGIC MODULE

Raymond A. Wolski, New Britain, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 17, 1974, Ser. No. 479,936

Int. Cl.² F42C *15/00*

U.S. Cl. 102—76 P **4 Claims**

3. A control mechanism comprising:

environmental sensing means having an energy output;

actuation initiation means;

time delay means;

first, second and third cam means movable from an initial position to a final actuation position;

plunger means coacting with said first and second cam means and movable from an initial position blocking movement of said third cam means;

said first cam means being driven under control of said time delay means from an initial position blocking movement of said plunger means to an actuation position allowing finite travel of said plunger means;

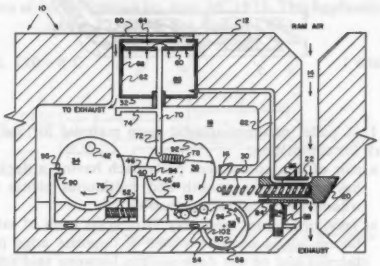
said second cam means being driven by energy developed by said environmental sensing means from an initial position blocking movement of said plunger means to an actuation position allowing full travel of said plunger means;

said third cam means carrying said actuation initiation means and being connected to said second cam means through an energy storage means;

said plunger means blocking movement of said third cam means until energy has been stored in said energy storage means;

whereby, when said first and second cam means move into the actuated position, said plunger will move into a position unlocking said third cam means and allowing said third cam means to move into the actuation initiation position;

said plunger means having first and second contoured portions and an intermediate relieved portion; and



said third cam means having first and second surfaces coacting with said contoured portions respectively of said plunger means;

so that said third cam means is initially prevented from movement by coaction of said first contoured surface of said plunger and said first surface of said third cam means; and

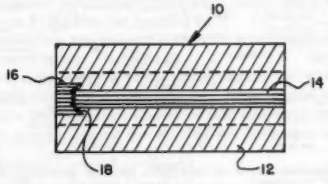
said third cam means, when activated, is locked in actuated position by coaction of said second contoured surface of said plunger and said second surface of said third cam means.

3,938,444

FLARE CARTRIDGE

Kenneth R. Foote, and Michael Mamula, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 5, 1974, Ser. No. 486,922
Int. Cl.[2] F42B 4/26
U.S. Cl. 102—99 7 Claims



4. A flare grain comprising:

a hollow segment of pyrotechnic material having a longitudinal bore;

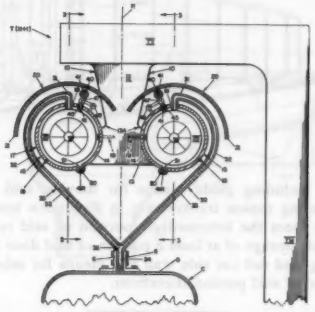
a partial counter bore in one end of said segment; and a plurality of cut curled protuberences in said counter bore.

3,938,445

TRACKWAY FOR OVERHEAD TRANSPORTATION SYSTEM

James A. Hughes, 3815 Avenue E, Kearney, Nebr. 68847

Filed Dec. 5, 1974, Ser. No. 529,731
Int. Cl.[2] E01B 25/22; B61B 13/08
U.S. Cl. 104—124 6 Claims



1. A trackway for an overhead transportation system of the general class comprising at least one car as a vehicle means depending from and longitudinally traversible along a trackway that is located above the earth's surface including a series of spaced pillars and each pillar having a post depending downwardly therefrom along a vertical post-axis, said transport system trackway comprising:

A. a pair of substantially parallel and co-elevational tubular conduits attached to a series of pillar posts and located on opposite sides of the vertical post-axis, the upper-hemiside of each conduit being longitudinally slottedly vented therethrough;

B. a pair of protective shields attached to the respective pillar posts and located on opposite sides of the vertical post-axis, each of said protective shields being longitudinally coextensive along and protectively overlying the upper-hemiside vent slots of the respective tubular conduits;

C. at least one lubeline coextensive along the outerwall of the respective tubular conduits and having serially spaced nozzles for high-pressure injection of lubricant fluid from each nozzle-station toward the conduit innerwall and operatively synchronizeable with the approaching vehicle;

D. a troughline coextensive along the lower-hemiside of and communicating with the innerwall of the respective tubular conduit for collection of the lubricant; and

E. means for recycling the lubricant fluid from the troughline back to the lubeline, said recycling means including a lubricant reservoir along the troughline and pump means for reintroducing the lubricant under high pressure into the lubeline.

3,938,446

DOOR ASSEMBLIES FOR CLOSING RAIL CAR END OPENINGS

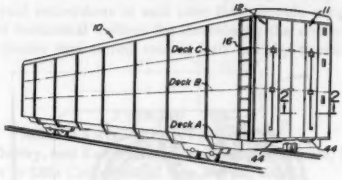
Robert F. Seitz, Hazelcrest; William E. Fritz, Hinsdale, and Thorvald Madland, Arlington Heights, all of Ill., assignors to The Youngstown Steel Door Co., Cleveland, Ohio

Filed Sept. 6, 1974, Ser. No. 503,747
Int. Cl.[2] B65J 1/22
U.S. Cl. 105—368 R 29 Claims

1. In a rail car having an interior cavity defined partially by rail car side walls and an end opening for loading and unloading lading:

a door assembly including panels for closing at least a portion of said end opening,

pivoted mounting means for moving said door assembly between an open position and a closed position,



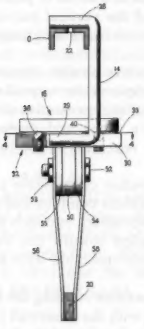
means including guide means for moving said pivoted mounting means transversely in directions toward and away from the intermediate portion of said rail car to permit storage of at least a portion of said door assembly along said rail car side wall and means for selective removal of said portion therefrom.

3,938,447

ARTICLE TRANSPORTING APPARATUS

Robert E. Veale, Hollis, N.H., assignor to Brodie, Inc., Woburn, Mass.

Filed June 17, 1974, Ser. No. 479,593
Int. Cl.² B61B 3/00
U.S. Cl. 105—156 **15 Claims**



1. An article transporting apparatus supported by a trolley member and comprising;

support means including means for receiving said trolley member so that said support means may travel with the trolley member and a plate means having a hole therein,

and a swivel support assembly including a cap member having means for engagement with a top surface of the plate means, means slidable in the hole and a lower end extending below the plate means, a support bar means for pivotally supporting the bar from the lower extending end of the cap member, and resilient means disposed between the means for pivotally supporting and the lower extending end of the cap member for dampening rotation therebetween,

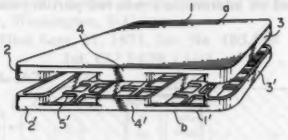
whereby the cap member is capable of movement relative to the plate means to permit relative turning therebetween.

3,938,448

PLASTIC PALLET

Kiyoshi Nishitani, Yokohama; Kimihiro Kawada; Riyuzo Ebina, both of Tokyo, and Katsunori Miyoshi, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 102,595, Dec. 30, 1970, abandoned. This application July 6, 1973, Ser. No. 377,110
Claims priority, application Japan, Apr. 9, 1973, 48-39440
Int. Cl.² B65D 19/18
U.S. Cl. 108—58 **13 Claims**



1. A pallet of thermoplastic resin material for use with a fork lift comprising:

a pair of like component parts each having a deck board having an outer smooth and continuous planar surface whereby said pallet is reversible,

at least one girder integrally formed on each of said deck boards along each of a pair of opposite edge portions thereof and on the deck surface between said edge portions,

multiple reinforcing ribs integrally formed on said deck board and projecting therefrom a lesser distance than said girders,

said component parts being secured together by melt adhesion, with the girders of one being melt adhered to the corresponding girders of the other, and

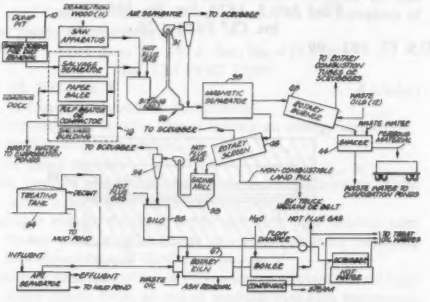
wherein each of said girders comprises an oblong ring, said reinforcing ribs being disposed within and between said girders.

3,938,449

WASTE DISPOSAL FACILITY AND PROCESS THEREFOR

James O. Frisz, Los Angeles, and Harold A. Price, Anaheim, both of Calif., assignors to Watson Industrial Properties, Los Angeles, Calif.

Filed Mar. 18, 1974, Ser. No. 451,859
Int. Cl.² F23G 5/12, 5/06
U.S. Cl. 110—8 C **13 Claims**



1. Process for non-pulluting disposal of solid wastes collected at a first location, which comprises:

moving said wastes along a predetermined path to a first station;

reducing the size of said wastes to a predetermined maximum in said first station;

firing said sized wastes in a reduced oxygen atmosphere at a temperature below about 2200°F;

firing said materials a second time in an oxygen-rich atmosphere; and

feeding back hot gases components obtained from said second firing to selected points along the path of movement of said wastes prior to firing for dehydrating said wastes.

3,938,450

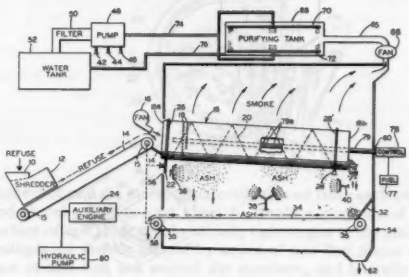
MOBILE FURNACE VEHICLE

John C. Jaronko, and John T. Jaronko, both of New Britain, Conn., assignors to Nutmeg Sanitation Inc., New Britain, Conn.

Division of Ser. No. 393,021, Aug. 30, 1973. This application Aug. 27, 1974, Ser. No. 501,061

Int. Cl.² F23G 5/12

U.S. Cl. 110—8 C **1 Claim**



1. A mobile apparatus for collecting and burning refuse comprising:

a chassis having wheels for movement between collection and disposal points and having thereon the following structures:

a hopper disposed on said chassis for receiving refuse;

a shredder communicating with said hopper for reducing the size of the refuse received by said hopper to particles suitable for burning;

a first transfer means for receiving refuse conditioned by said shredder;

a conveyor belt having a perforate generally planar surface for allowing passage of ash therethrough and having first and second ends, said first end communicating with said transfer means for receiving said refuse;

a fan communicating with said conveyor belt generally planar surface for supplying air;

a hollow tube disposed generally parallel with respect to said conveyor belt and having a plurality of apertures disposed substantially uniformly about the circumference being size for burning fuel;

a fuel supply and control means for supplying fuel to said hollow tube;

a liquid supply and a liquid spray means for wetting ash passing out of said conveyor belt through said perforate surface and said second end of said conveyor belt;

second transfer means for moving ash from said conveyor belt;

an ash receiving means disposed in communication with said second transfer means;

a substantially closed housing mounted on said chassis and enclosing said conveyor belt, liquid spray means, second transfer means and at least a portion of said hollow tube;

a second fan in fluid communication with said substantially closed housing for directing smoke from the area of said conveyor belt; and

a purifying tank for washing the smoke conducted by said second fan and in fluid communication therewith.

3,938,451

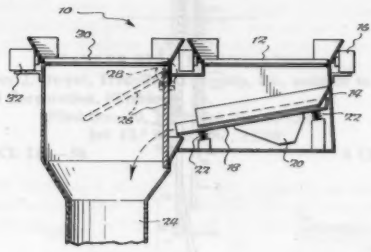
GASIFIER CHARGING SYSTEM

Theodore W. Lucas, Jr., Williamsville, N.Y., assignor to Andco Incorporated, Buffalo, N.Y.

Filed Jan. 3, 1975, Ser. No. 538,344

Int. Cl.² F23K 3/16

U.S. Cl. 110—109 **8 Claims**



1. A refuse feeder for a solid waste destruction system having a gasification chamber and conduit means for conveying solid waste materials to the gasification chamber in which the flame temperature of the waste materials is reached so as to reduce the waste materials to a molten condition with resulting gases and vapors being produced, and means for removing the molten waste material, resulting gases, and vapors from the system; said refuse feeder comprising:

a storage hopper means for receiving solid waste material wherein said storage hopper is adapted to communicate with said conduit means so as to urge waste material toward said conduit means,

first sealing door means movable between open and closed positions and being mounted on said storage hopper, said first sealing door means being normally in a closed position to seal the interior of said storage hopper means from the ambient atmosphere and being in an open position for filing of said hopper means with waste material, and

second sealing door means movable between open and closed positions and being mounted intermediate to said storage hopper means and said conduit means whereby said second sealing door means is in a normally closed position to seal said conduit means from said ambient atmosphere when said first sealing door means is in an open position.

3,938,452

ADJUSTABLE POINT LOOPING TOOL FOR RUG MAKING

Michael J. Windle, 45131 28th St. E., Lancaster, Calif. 93534

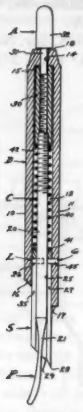
Filed Aug. 16, 1974, Ser. No. 497,920

Int. Cl.² D05C 15/06

U.S. Cl. 112—80 **22 Claims**

1. A pointer for looping yarn in the building of rugs and the like upon backings comprised of a multiplicity of apertures in checkerboard pattern defined by crossed members, and including; an elongated body having a lower terminal end, a probe fixedly positioned to extend from the lower terminal end of the body and having a concaved notch at its lower terminal end spaced from the lower terminal end of the body, a retractile stop normally projected to an extended position with a shoulder positioned intermediate the lower terminal ends of the probe and body respectively, and spring means engaged with and operable between the stop and a face in the body to yieldingly urge the stop to said extended position,

whereby said shoulder of the stop is retractile to the lower terminal end of the body when engaged to hold against the



entry leg of a loop of yarn while the exit leg of said loop is being fully extended.

3,938,453

APPARATUS FOR ADVANCING THE FEED FRAME OF AN AUTOMATIC EMBROIDERY MACHINE

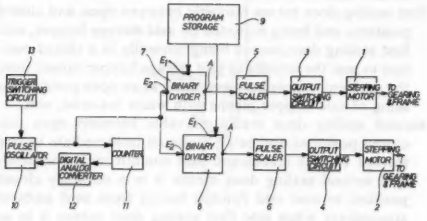
Arno Muller, Mellen, Switzerland, assignor to Omni Ray AG, Zurich, Switzerland

Filed July 23, 1974, Ser. No. 490,964

Claims priority, application Switzerland, July 30, 1973, 11090/73

Int. Cl.² D05C *3/02*

U.S. Cl. 112—102 **6 Claims**



1. An apparatus for feeding the embroidery frame of an automatic embroidery machine, comprising two stepping motors drivingly connected with the embroidery frame, each of said stepping motors bringing about a feed of the embroidery frame in one direction, a control mechanism operatively connected with said stepping motors, said control mechanism generating control pulses for each stepping motor as a function of the momentarily required feed displacement of the embroidery frame in each direction, said control mechanism comprising two switching circuits, each switching circuit being operatively connected with one of the stepping motrs, a program storage operatively connected with said switching circuits, said switching circuits generating output pulses, the number of which is proportional to the number of pulses delivered to each switching circuit by said program storage and by means of which there is determined the magnitude of the momentarily required feed displacement in the corresponding direction, said switching circuits comprising programable binary dividers, each binary divider comprising a rate multiplier and having a pair of inputs, a pulse oscillator, one input of each binary divider being operatively coupled with the program storage and the other input with the pulse oscillator, and a trigger switching circuit and a counter, the pulse oscillator being operatively connected with said trigger switching circuit and said counter, said trigger switching circuit generating a trigger signal for turning-on the pulse oscillator and said counter serving to switch-off the pulse oscillator after generating a predetermined number of pulses, and said pulse oscillator generating pulses of a first frequency upon the arrival of the trigger signal and continually increasing the frequency of the generated pulses up to a second value.

3,938,454

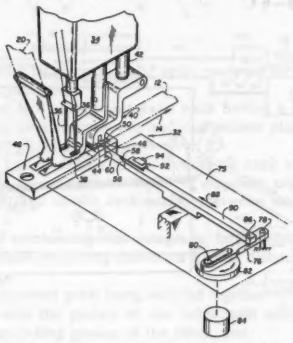
SEWING MACHINE CUTTING DEVICE

Ronald J. Boser, 19 Branwood Drive, Dix Hills, N.Y. 11746

Filed Nov. 8, 1973, Ser. No. 413,847

Int. Cl. D05b *37/04*

U.S. Cl. 112—130 **3 Claims**



1. The combination with a sewing machine having a work surface and means defining a feed path along said work surface for work being sewn by said sewing machine of a cutter for severing said work at the termination of the sewing interval, said cutter comprising wall means bounding a cutting compartment below said work surface and along said feed path, crank means located adjacent said feed path and extending into said cutting compartment, a blade operatively connected to be continuously reciprocated by said crank means disposed in said cutting compartment, a work-positioning member mounted on said sewing machine for selective descending movement into said cutting compartment for moving said work therewith into said cutting compartment, and depending bifurcated extensions on said work-positioning member adapted to urge and hold said work in spanning relation therebetween in cutting contact with said continuously reciprocating blade, whereby a severing cut is produced in said work for the length thereof in said spanning relation between said depending extensions.

3,938,455

METHOD OF FORMING AND A CONSTRUCTION FOR A DIGITALLY OPENABLE CONTAINER CLOSURE

Hugh C. Urmston, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

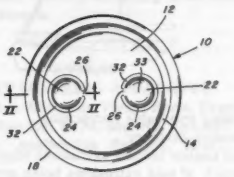
Division of Ser. No. 357,937, May 7, 1973, which is a continuation-in-part of Ser. No. 281,541, Aug. 17, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,692

Int. Cl.² B21D *51/26*

U.S. Cl. 113—121 C **10 Claims**

1. In the formation of a sheet metal container component having at least one inwardly displaceable opening panel and an outwardly projecting deflectable portion disposed in integral interconnected relation therewith by a selectively shaped, residually stressed, fracturable web, the steps of introducing a sheet of metal intermediate a first die member having a first

substantially planar surface and a second and angularly disposed substantially planar metal extruding surface defining therewith a first obtuse corner at the locus of intersection therebetween and a second and correspondingly shaped die member having a first substantially planar base surface and a second and angularly disposed substantially planar metal extruding surface defining therewith a second obtuse corner at the locus of intersection therebetween, and with auxiliary die means disposed on the same side of the sheet as said first die member having a metal shaping base surface facing the same general direction as does said first surface of said first die member and in laterally spaced relation with said first surface of said second die member; lineally displacing said first die member towards said second die member to selectively move said first and second surfaces of said first die member into operative proximity with said second and first surfaces respectively of said second die member with said first and second



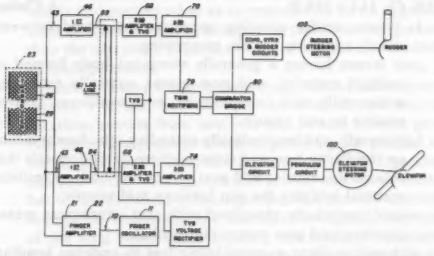
corners of said die members laterally spaced from each other, and thereby engage said sheet to displace portions of the surface of said sheet at substantially right angles to the initially undisplaced surface thereof by action of said first planar surface of said first and second die members, and laterally extrude portions of said sheet within the locus of displacement thereof through the conjoint action of said first and second surfaces of said first and second die members to form said fracturable web, stopping said die member displacement when said first planar surface of said first die member is disposed substantially coplanar with said first planar surface of said second die member, and lineally displacing said auxiliary die means towards said second die member to selectively move said base surface thereof into predetermined longitudinally offset relation with said first surface of said second die member in the direction of die displacement to form said deflectable portion by the conjoint action thereof.

3,938,456

AUTOMATIC STEERING SYSTEM FOR A TORPEDO

Paul C. Gardiner, Scotia, N.Y.; Robert S. Gardner, Key West, Fla.; Clifford Mannal, Schenectady, and John H. Payne, Ballston Spa, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1950, Ser. No. 188,468
Int. Cl.² F42B *19/01*
U.S. Cl. 114—23 **12 Claims**



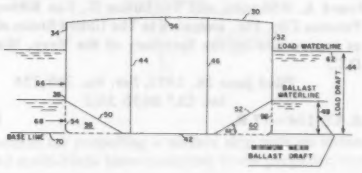
1. In an automatic steering system for directing a moving body, said system being provided with reversibly-motorized depth steering gear including two motor reversing circuits, one, upon energization, setting said gear for climb and another, upon energization, setting said gear for dive, a pendulum mounted for swinging movement in either of two directions relative to said body and having contacts adapted to close one of said climb and dive circuits depending on the direction of said relative swinging movement, and a follow-up link transmitting steering movement of said motorized gear to said pendulum contacts thereby affecting the energization of said circuit.

3,938,457

TANKER HULL MODIFICATION

Stanley J. Dwyer, Tredyffrin Township, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1974, Ser. No. 537,567
Int. Cl.² B63B *1/00, 25/08*
U.S. Cl. 114—56 **6 Claims**



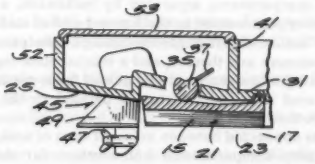
1. A tanker vessel having a hull and a minimum mean ballast draft depth line on said hull which is defined by a change in width of said hull along the midbody of the hull, the volume enclosed by said hull above said minimum mean ballast draft depth line being substantially greater than the volume enclosed by said hull below said minimum mean ballast draft depth line, the width of the midbody of said hull being substantially uniform above said minimum mean ballast draft depth line and the width of the midbody of said hull progressively decreasing from said mean ballast draft depth line to the bottom of said hull, the interior of said hull partitioned to define a plurality of separate compartments, some of said compartments designated for cargo and others of said compartments designated only for water ballast, the volume enclosed by said hull below said mean ballast draft depth line being substantially the sum of the volume of water displaced by the weight of the vessel plus the volume of the water in said water ballast compartments.

3,938,458

ADJUSTABLE BOAT HULL

Finn T. Irgens, Wauwatosa, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 23, 1974, Ser. No. 536,000
Int. Cl.² B63B *1/22*
U.S. Cl. 114—66.5 P **6 Claims**



1. A boat including a hull comprising a transom, a bottom surface extending forwardly from said transom and including an opening located in forwardly spaced relation from said transom and having leading and trailing edges, a forward bottom surface portion which curves upwardly and forwardly from adjacent to said leading edge of said opening, and a

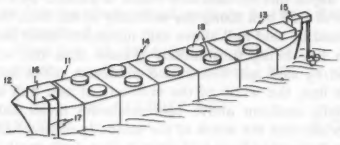
rearward bottom surface portion which curves upwardly and rearwardly to said transom from adjacent to said trailing edge of said opening, a panel having leading and trailing edges, means pivotally mounting said panel to said boat hull for movement relative to said opening about a transverse axis between a first position wherein said leading and trailing edges of said panel merge with said forward and rearward portions of said bottom surface so as to provide a continuously smooth sailing hull, and a second position wherein said panel leading edge merges with said forward portion of said bottom surface and said panel trailing edge is spaced below said rearward portion of said bottom surface so that said panel forms part of a planing surface, and means for pivotally displacing said panel between said positions.

3,938,459

MINESWEEPER

Edward A. Wilbanks, and Vordaman H. Van Bibber, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 26, 1972, Ser. No. 268,224
Int. Cl.[2] B63B 3/02
U.S. Cl. 114—77 R **10 Claims**



1. A marine minesweeper, comprising in combination:

a hull, having a plurality of unitary compartmental sections disposed along the longitudinal axis thereof, with adjacent ones thereof configured for complementary fits therebetween, adapted for being floated along a watercourse suspected of being mined with marine mines, the plurality of unitary compartmental sections of said hull including a bow section, a stern section, and at least one intermediate section connected between said bow and stern sections, with said at least one intermediate section having a foam plastic hull-configured intermediate portion containing cells of air bubbles and having a plurality of compartments separated by bulkheads, a first plate securely connected to the forward end of said foam plastic hull-configured intermediate portion parallel to the transverse axis thereof, and a second plate securely connected to the rearward end of said foam plastic hull-configured intermediate portion parallel to the transverse axis thereof;

means connected between adjacent ones of said plurality of unitary compartmental hull sections for the fastening thereof together in a secure abutting manner;

means disposed between and substantially around the periphery of said adjacently fastened hull sections for effecting a watertight seal thereat; and

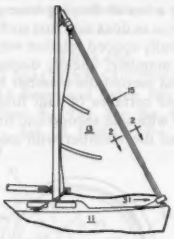
ballast means of predetermined mass disposed in each of the plurality of unitary compartmental hull sections for effecting a predetermined draft of said hull within the aforesaid watercourse, as it is floated therealong.

3,938,460

SAIL-RAISING SYSTEM

Walter M. Wales; Donald K. Mitchell, both of Marblehead, and Kenneth C. Smalley, Beverly, all of Mass., assignors to Hood Sailmakers, Inc., Marblehead, Mass.

Filed Mar. 4, 1974, Ser. No. 447,497
Int. Cl.[2] B63H 9/04
U.S. Cl. 114—106 **4 Claims**



1. Jib-setting apparatus comprising:

a wire tension member;

a series of similar tubular extrusions adapted to fit over said wire, each of said extrusions being grooved on opposite sides thereof;

on one side of said series of tubular extrusions, a first series of extrusions each having a portion of generally C-shaped cross-section forming an elongate slot, the extrusions in said first series being grooved to engage and lock onto the grooves on said one side of the tubular extrusion with the abutting ends of extrusions in said first series being staggered with the abutting end of said series of tubular extrusions; and

on the opposite side of said series of tubular extrusions, a second series of extrusions each having a portion of generally C-shaped cross-section forming an elongate slot, the extrusions in said second series being grooved to engage and lock onto the grooves on said other side of the tubular extrusion with the abutting ends of extrusions in said second series being staggered with the abutting end of said series of tubular extrusions.

3,938,461

FLEXIBLE CONNECTION FOR ARTICULATING VESSELS

John E. Marriner, 555 East Ocean Blvd., Long Beach, Calif. 90802

Continuation-in-part of Ser. No. 399,423, Sept. 21, 1973, Pat. No. 3,822,667, which is a division of Ser. No. 251,021, May 8, 1972, Pat. No. 3,799,100, which is a continuation-in-part of Ser. No. 88,938, Nov. 12, 1970, abandoned. This application Apr. 29, 1974, Ser. No. 464,746. The portion of the term of this patent subsequent to July 9, 1991, has been disclaimed.
Int. Cl.[2] B63B 21/56
U.S. Cl. 114—235 R **6 Claims**

1. Force-transfer coupling apparatus interposed between two closely adjoining vessels, comprising:

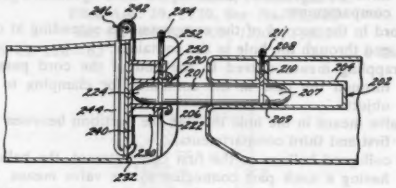
post means having a generally elongated body formed of resilient material, said post means normally extending horizontally and longitudinally in a cantilever fashion relative to said vessels;

horizontally and longitudinally extending attachment means on the facing bow and stern portions of said vessels that receive the ends of said post means, the body of resilient material bridging the gap between said vessels;

means operatively associated with said attachment means securing said post means therewithin;

with said resilient material being free to undergo bending, compression and tension in transferring compressive and tensive forces between said vessels; and

means operatively associated with one of said attachment means to adjust the vertical position thereof relative to its



respective vessel thereby affording draft compensation between said vessels.

3,938,462

BOAT MOORING APPARATUS

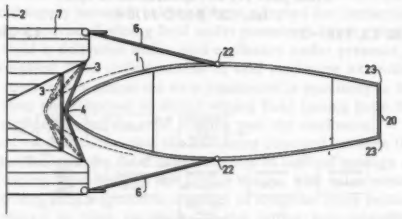
Bertil Brandt, 6, Rue Alfred de Vigny, Paris, France

Filed Mar. 26, 1974, Ser. No. 454,987

Claims priority, application Sweden, Mar. 27, 1973, 7304277

Int. Cl.[3] B63B *21/00*

U.S. Cl. 114—230 3 Claims



1. Apparatus for mooring boats and being of the type which fixedly secures one end of the boat while simultaneously preventing pivoting of the boat about said one end in response to wind and wave forces acting on the boat comprising:

a fixed support platform including a pair of spaced support elements, said support elements being rigidly affixed to said support platform

at least one stretchable elastic member supported between said spaced support elements and against which said one end of the boat is positioned upon mooring and with the logitudinal axis of the boat at approximately a right angle to said elastic member,

a pair of support members mounted on said support elements and positioned so as to respectively lie on opposite sides of said boat and with a spacing therebetween greater than the maximum expected beam of a boat to be moored at said apparatus,

and lines extending under tension from each of said support members to said boat on opposite sides thereof and at locations remote from said one end of said boat to provide force components which respectively act parallel to the longitudinal axis of the boat to resiliently urge said one end of the boat against said at least one elastic member to thereby distend said member and provide a recess therein for embracing and fixedly securing said one end of the boat while simultaneously the force components acting transversely of said longitudinal axis prevent pivoting of the boat with respect to said fixed support platform about its said one end.

3,938,463

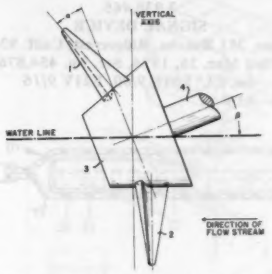
INCLINED RAKED PARTIALLY SUBMERGED PROPELLERS

Richard Hecker, Germantown, Md., and Edward A. Butler, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 4, 1973, Ser. No. 357,299

Int. Cl.[2] B63H *1/28*

U.S. Cl. 115—34 R 2 Claims



1. A method for propelling a surface ship with an inclined shaft raked multi-blade supercavitating screw propeller, comprising:

rotating a screw propeller in the range of 30 to 50% submergence in water;

producing a substantially horizontal thrust from blade interaction with water only during the lower 180° of the circle of rotation of each blade;

producing a positive transverse thrust component during the first half of the duration of a blade's engagement with water; and,

producing a retarded flow and high negative transverse thrust component during the second half of the duration of a blade's engagement with water which is substantially equal to said positive transverse force.

3,938,464

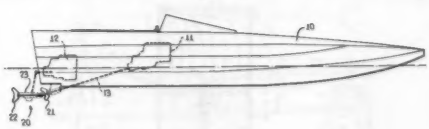
CONTRA-ROTATING PROPELLER DRIVE SYSTEM

John D. Gill, Foot of Sixth St., Annapolis, Md. 21403

Filed Mar. 27, 1974, Ser. No. 455,229

Int. Cl.[3] B63H *5/10*

U.S. Cl. 115—34 C 13 Claims



1. A contra-rotating propulsion system for a water craft having a hull defined along its bottom by a keel, said system comprising:

a forward propeller having blades disposed about a first axis of rotation;

an aft propeller having blades disposed about a second axis of rotation;

said first and second axes of rotation being vertically co-planar;

means for supporting said forward and aft propellers one behind the other below the depth of said keel in a manner to permit independent movement of at least one of said propellers relative to the other;

a first engine located in said hull;

first drive means coupling said first engine to said forward propeller for imparting forward motion to said craft by

rotating the blades of said first propeller about said first axis of rotation;

a second engine located in said hull; and

second drive means entirely independent of said first drive means coupling said second engine to said aft propeller for imparting forward motion to said craft by rotating the blades of said second propeller about said second axis of rotation in contra-rotation to said forward propeller.

3,938,465

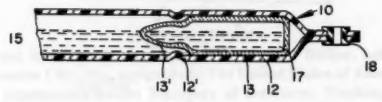
SIGNAL DEVICE

John H. Lyons, 351 Rancho, Ridgecrest, Calif. 93555

Filed Mar. 26, 1974, Ser. No. 454,876

Int. Cl.² E01F 9/00; F21V 9/16

U.S. Cl. 116—63 P **5 Claims**



1. For use as a signal device to be deployed upon a supporting surface, the combination comprising:

an elongated light member comprising a plastic tube containing chemiluminescent material means;

support means comprising at least one configured piece of resilient plastic sheet material, at least one edge portion of said plastic sheet material cooperating with said plastic tube to maintain said tube at approximately a 45° angle to the surface upon which it is deployed;

said plastic tube being relatively compressible and said support means having a non-circular central opening fitting on said tube with sufficient friction to maintain said tube and said holder assembled with the holder intermediate the ends of said tube and orthogonal to the longitudinal axis thereof.

3,938,466

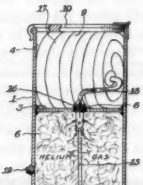
LOCATION INDICATING DEVICE

Jay W. Crissman, Rosemead, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 7, 1974, Ser. No. 512,555

Int. Cl.² B64B 1/52

U.S. Cl. 116—124 R **1 Claim**



1. A location indicating device, comprising

a container having two partitions therein forming three compartments, each of the partitions having a hole therethrough, the container being open at one end at a first of the compartments and having a selectively openable cap covering the open end thereof and a hole formed through another end thereof at a second of the compartments, the third compartment being between the first and second compartments;

cord in the second of the compartments extending at one end through the hole in the container;

grappling means affixed to the end of the cord passing through the hole in the container for clamping to an object;

valve means in the hole through the partition between the first and third compartments;

a collapsed balloon in the first compartment, the balloon having a neck part connected to the valve means, the cord extending through the hole through the partition between the second and third compartments and being affixed to the valve in the third compartment; and

a valve in the container extending into the third compartment for filling said compartment with buoyant gas for filling the balloon via the valve means when the cap of the container is opened.

3,938,467

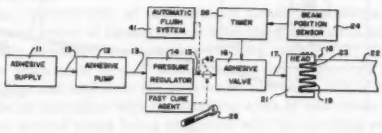
END JOINTED BEAM AND LAMINATED BEAM ADHESIVE APPLICATION SYSTEM AND HEAD FOR USE THEREIN

Richard D. Radowicz, 25860 Rancho Alto, Carmel, Calif. 93921

Filed Jan. 17, 1974, Ser. No. 434,087

Int. Cl.² B65C 11/04

U.S. Cl. 118—2 **13 Claims**



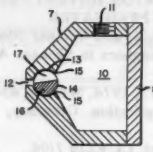
1. A system for applying adhesive to surfaces to be bonded having specific contours comprising means for containing a supply of adhesive, an outlet line connected to said supply of adhesive, a pump for urging the adhesive to flow through said outlet line, an adhesive valve for receiving and metering the adhesive, means for controlling said adhesive valve to pass adhesive flow for a predetermined time, whereby a predetermined quantity of adhesive is passed therethrough, an adhesive dispensing head mounted for relative movement with the surfaces to be bonded and connected to receive said predetermined quantity of adhesive, application surfaces on said dispensing head being formed of intersecting planar surfaces having parallel lines of intersection and closely matching the contours of the surfaces to be bonded, said adhesive dispensing head having a plurality of channels therein for conveying said predetermined quantity of adhesive therethrough to be dispensed at said application surfaces, and including a plenum chamber for receiving said predetermined quantity of adhesive, said plurality of channels including at least one separate channel for said plenum chamber to each of said planar surfaces and means for sensing when said application surfaces are in a predetermined proximate position relative to the surfaces to be bonded, said last named means being connected to actuate said means for controlling, whereby the surfaces to be bonded receive said predetermined quantity of adhesive along a predetermined length thereof while adjacent surfaces are maintained free of adhesive.

3,938,468

APPARATUS FOR WIPING LIQUID FROM A STRIP

James B. Kirschner, Moundsville, W. Va., assignor to Wheeling-Pittsburgh Steel Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1970, Ser. No. 32,826
Int. Cl.[2] B05C 11/00, 13/02
U.S. Cl. 118—63 6 Claims



1. In an apparatus for wiping liquid from the surface of a moving strip without contacting the strip and including an enclosure in proximity to the pass line of the strip and adapted to receive wiping fluid under pressure and orifice means formed in the enclosure and directed toward the strip, the improvement which comprises elongated valve means adjacent to and behind said orifice and coextending with at least a substantial portion of said orifice means.

3. Apparatus for wiping liquid, molten metal from the surface of moving metallic strip comprising:

an enclosure extending transversely of the strip to be wiped;

fluid supply means to said enclosure adapted for connection to a source of wiping fluid under pressure whereby wiping fluid is delivered inside said enclosure under pressure;

elongated fluid orifice means in said enclosure extending transversely across the strip positioned in proximity to the strip and disposed to direct wiping fluid issuing from the orifice against the strip moving past the enclosure;

fluid valve means within the enclosure disposed between the orifice and the fluid supply means to control passage of wiping fluid through the orifice means, said valve means comprising a rotatable member of irregular cross section placed in close proximity to the orifice and extending substantially parallel to the orifice from end to end of the orifice, incremental sections of the valve means thereby restricting flow through incremental lengths of the orifice, whereby in one position the valve means opens greater area between the fluid supply means and orifice than in another position of the valve means.

3,938,469

APPARATUS FOR COATING PARTICULATE MATERIAL WITH FINELY DIVIDED SOLIDS

Harold Henry Nau, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 230,016, Feb. 28, 1972, abandoned, which is a division of Ser. No. 149,350, June 2, 1971, Pat. No. 3,666,523, and a continuation-in-part of Ser. No. 804,621, March 5, 1969, abandoned. This application Sept. 14, 1973, Ser. No. 397,551
Int. Cl.[2] B05C 5/00
U.S. Cl. 118—303 1 Claim

1. An apparatus for uniformly coating a granular fertilizer with a small amount of a finely divided nutrient material having an average bulk density above about 1.2 g./ml. selected from the group consisting of micronutrients, secondary nutrients and mixtures thereof comprising, in combination:

a. a hopper for storing granular fertilizer;

b. a control gate adapted to produce a metered flow of fertilizer from said hopper in the form of a falling curtain;

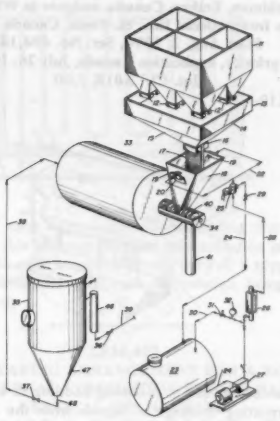
c. a storage vessel adapted to contain a binder solution;

d. nozzles disposed so as to provide spray of said binder solution below said gate, at opposite sides of said curtain so as to produce uniformly sprayed granular fertilizer;

e. conduits adapted with valve means so as to convey the binder solution at a desired pressure from said storage vessel to said nozzles;

f. a mixing chamber comprising a tumbling drum adapted to blend said sprayed fertilizer with said nutrient material;

g. a conveyor adapted so as to receive said sprayed granular fertilizer below said nozzles and to convey the fertilizer received into and from said tumbling drum;



h. a blow case equipped with a pressurizing means adapted to receive said nutrient material; and

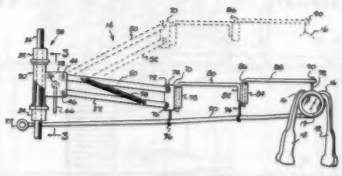
i. a conduit adapted to inject said nutrient material into said tumbling drum under superatmospheric pressure from said blow case to form a cloud of nutrient material after said chamber is sealed with the sprayed granular fertilizer.

3,938,470

MOVABLE SUPPORTING DEVICE FOR MILKING APPARATUS

J. Don Pace, 1420 Brown Circle, Boulder, Colo. 80303

Filed Mar. 25, 1974, Ser. No. 454,571
Int. Cl.[3] A01J 7/00
U.S. Cl. 119—14.1 19 Claims



1. A movable supporting device for milking apparatus having a milking claw, said device comprising:

a stationary support column;

a first pivot means having a collar portion and a plate portion;

a first arm having one end connected to said plate portion of said first pivot means so that said first arm pivots about a first predetermined axis;

a second pivot means connected to the other end of said first arm;

additional arm means having one end receiving and supporting said milking claw and the other end connected to said second pivot means to that said additional arm means pivots about a second predetermined axis that is substan-

tially normal to said first predetermined axis regardless of movement of said first arm; and

actuating means connected with said first and additional arms to control movement of the arms in at least one direction.

3,938,471

BEDDING RETAINER WITH DRAINAGE FACILITY

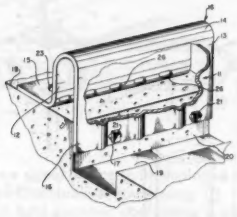
Adrian Veldman, Embro, Canada, assignor to Wildwood Farm Services International Inc., St. Pauls, Canada

Filed Aug. 2, 1974, Ser. No. 494,183

Claims priority, application Canada, July 26, 1974, 205752

Int. Cl.² A01K *1/00*

U.S. Cl. 119—28 8 Claims



1. A device for use in retaining bedding in an animal stall while permitting drainage of liquids from the stall, the stall having a floor bounded by a gutter, the device comprising a horizontally elongated upright portion adapted to extend above the floor of the stall, a flange integral with the upright portion and extending laterally therefrom in the plane of the floor, a skirt depending from the upright portion that extends below the plane of the floor, the improvement comprising at least one passage extending through the upright portion to permit the flow of liquids to pass through the upright portion.

3,938,472

EGG INCUBATOR OF THE TUNNEL TYPE

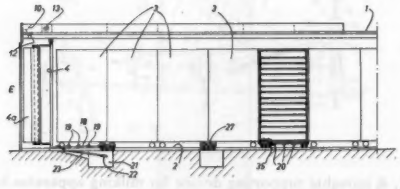
Francois Jauneaud, Indre-et-Loire, France, assignor to Bekoto, Indre-et-Loire, France

Filed July 8, 1974, Ser. No. 486,429

Claims priority, application France, July 12, 1973, 73.25662

Int. Cl.² A01K *41/00*

U.S. Cl. 119—37 8 Claims



1. In an egg incubator of the tunnel type comprising an inlet chamber at one end and an outlet chamber at the other and two sets of parallel rails adapted to receive two rows of trolleys carrying egg drawers which tip under the action of tilting parallelograms, two sliding panels equipped with fans, each placed opposite a different row of trolleys, one at the inlet chamber, the other at the outlet chamber so as to create a longitudinal flow of circulating air capable of being reversed by changing the positions of the panels, each panel then changing its row, at least one curtain forming two passages in each of which said longitudinal flow of air is established, the tilting parallelograms being mounted on said trolleys in such manner that only the edge of the drawers opposes said longitudinal flow of air thus obtaining a constant section of passage with a minimum loss of pressure and in consequence a fairly high speed of passage in order to render the temperatures homogeneous.

3,938,473

STEAM GENERATOR HAVING FEED-WATER PREHEATER

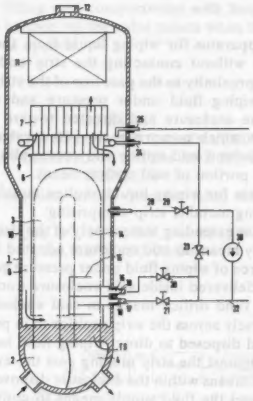
Hans Mayer, Bubenreuth, and Werner Nieschler, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 17, 1974, Ser. No. 434,359

Claims priority, application Germany, Jan. 26, 1973, 2303875

Int. Cl. F22b *1/06*

U.S. Cl. 122—32 3 Claims



1. A steam generator having an upstanding feed-water casing with a steam output outlet and enclosing an upstanding heat exchanger radially enclosed by a shroud forming a feed-water descent space by being spaced from the inside of said casing and having top and bottom openings so feed-water in said casing circulates by rising within said shroud and descending via said descent space, a feed-water preheater being heated by a lower portion of said heat exchanger and discharging into said shroud, and a feed-water input pipe line for said preheater extending through said casing for connection with an external source of feed-water; wherein the improvement comprises means for removing feed-water from said descent space at a location above said preheater and introducing it to said feed-water input pipe line to increase the temperature and flow rate of feed-water fed to said preheater and thereby lower the rate of heat exchanged thereto from said heat exchanger.

3,938,474

DISPENSER FOR COLLAPSIBLE TUBES

Harford E. Goings, P.O. Box 64, Manassas, Va. 22110

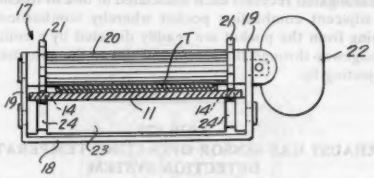
Filed Dec. 13, 1974, Ser. No. 532,585

Int. Cl.³ B65D *35/28*

U.S. Cl. 222—102 1 Claim

1. A collapsible tube dispenser comprising an elongate flexible plastic member for supporting a collapsible tube thereon, a frame, a plurality of rack forming apertures formed in a row down each of the opposite side edges of said flexible member, a pair of squeeze rollers journalled in said frame for engaging over the flexible member with the collapsible tube positioned thereagainst for squeezing the collapsible tube against the flexible member, hand rotatable spur gears rigidly

mounted on one of said squeeze rollers for rotating said rollers to move said frame as said spur gears engage the rack apertures, a hand key rigidly secured to the roller carrying said



spur gears, and annular grooves adjacent opposite ends of the second of said rollers with the spur gears on the other of said rollers engaging in said annular grooves.

3,938,475

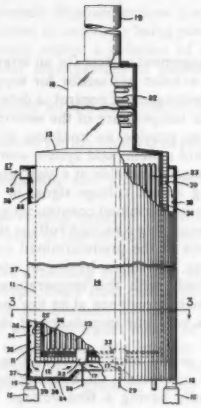
FIRED HEATER WITH DOUBLE CASING

Thomas F. O'Sullivan, Montclair, N.J., and Henricus J. Knol, Voorburg, Netherlands, assignors to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 470,937, May 17, 1974, abandoned. This application Mar. 12, 1975, Ser. No. 557,753

Int. Cl.[2] F22B *21/00, 21/30*

U.S. Cl. 122—333 **7 Claims**



1. A direct fired heater comprising in combination: an inner casing enclosing a combustion chamber and having a first end, at least one burner communicating with the combustion chamber and penetrating the casing via the first end, and an outer casing spaced from the first end to form a passage in flow communication between atmosphere and the burner, said passage being provided with an acoustic and insulative surface.

3,938,476

TUBE SUPPORT

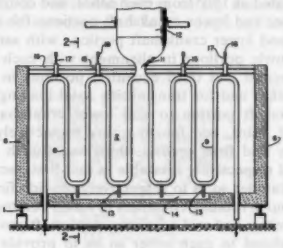
Robert F. Kaupp, Willow Grove, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Dec. 30, 1974, Ser. No. 537,435

Int. Cl.[2] F22B *37/24*

U.S. Cl. 122—510 **3 Claims**

1. A tube heater including structure forming a heating chamber having oppositely disposed side walls, a floor and a roof, said roof having a slot extending lengthwise thereof substantially midway between said side walls, burners to heat said chamber, a coil having vertically disposed convolutions located substantially midway between said side walls, a support having a vertically movable portion above said slot, one end of said coil extending through said slot and being fixedly attached to said movable portion, a bracket attached to the



upper end of each convolution and extending through said slot, and movable means to support a convolution of the coil connected with each bracket whereby the coil is supported to move as a whole and with each convolution being able to move separately.

3,938,477

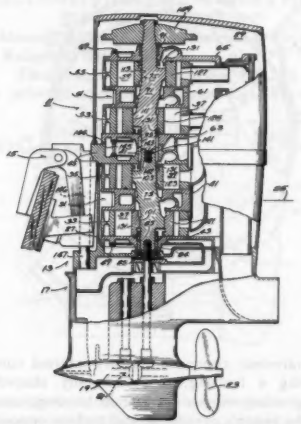
THRUST BEARING ARRANGEMENT FOR A ROTARY PISTON INTERNAL COMBUSTION ENGINE HAVING A VERTICAL CRANKSHAFT

George E. Miller, Libertyville; Michael J. Griffith, Waukegan, both of Ill., and Russell J. Van Rens, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 20, 1974, Ser. No. 444,051

Int. Cl.[2] F02B *53/00*

U.S. Cl. 123—8.07 **6 Claims**



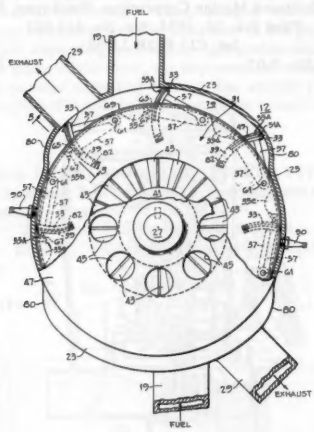
1. An internal combustion engine comprising a lower housing assembly including first and second trochoid shaped rotor cavities in aligned relation to each other, said lower housing assembly also including a thrust bearing, an upper housing assembly including third and fourth trochoid shaped rotor cavities in aligned relation to each other and to said first and second cavities, a crankshaft including, in series, first, second, third, and fourth eccentric portions respectively extending through said first, second, third, and fourth cavities, said crankshaft including a lower portion rotatably supported in said lower housing assembly and including first and second eccentric portions located at 180° from each other, said lower

crankshaft portion also including an annular shoulder engaged with said thrust bearing to transmit axial loading from said lower crankshaft portion to said lower housing assembly and constituting the sole axial support for said crankshaft and an upper crankshaft portion rotatably supported in said upper housing assembly and including said third and fourth eccentric portions located at 180° from each other, and coupling means on said upper and lower crankshaft portions for connecting said upper and lower crankshaft portions with said first and fourth eccentric portions in alignment with each other and with said second and third eccentric portions in alignment with each other and for transmitting axial loading from said upper crankshaft portion to said lower crankshaft portion, first, second, third, and fourth rotors respectively rotatably mounted on said first, second, third and fourth crankshaft portions and respectively rotatable in said first, second, third, and fourth cavities so as to respectively provide first, second, third, and fourth rotating chambers in which combustion takes place, said rotors and said eccentric crankshaft protions being angularly related to each other so as to provide rotational balance without counterweighting, and gear means on said housing means and on said rotors for effecting relative rotation between said rotors and said crankshaft and between said crankshaft and said housing means in response to combustion in said chambers.

3,938,478
ROTARY INTERNAL COMBUSTION ENGINE

Jack N. Piper, 103 Collins Ave., Pleasantville, N.J. 08232

Filed Apr. 29, 1974, Ser. No. 464,909
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.33 **15 Claims**

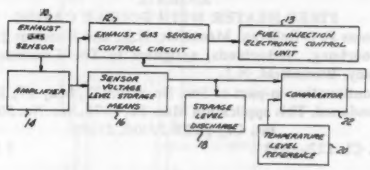


14. In a valveless, concentric, rotary internal combustion engine having a housing, a cylindrically shaped piston mounted for rotary movement in said housing, combustion pockets in the piston's peripheral wall surface opposed to the inner wall surface of the engine's housing, a variable volume working chamber defined by the inner surface of the engine's housing on one side and opposite thereto the piston's wall surface, said working chamber providing the space necessary for receiving the fuel and alternate compression of gases after the gases are ignited followed by exhaustion of the gases from the chamber, gate members pivotably mounted on said piston for substantially frictionless reciprocatable movement so as alternately to compress combustion gases in the piston's combustion pockets and permit the gases to be released therefrom, said gate members each having extending substantially perpendicular thereto an arm which is secured at the arm's other extremity to the rotary piston, at least one projecting lip near the radially outward extremity of the gate member which serves to trap gases emerging from the combustion pockets in a manner which supplements centrifugal force in a radially outward direction, elongated slots within the peripheral surface of the rotary piston to receive the gate member's arms, and elongated recesses each associated at one of its ends with an adjacent combustion pocket whereby combustion gases issuing from the pocket are readily directed by a connecting passageway through the recess and slot to the gate member's projecting lip.

3,938,479
EXHAUST GAS SENSOR OPERATING TEMPERATURE DETECTION SYSTEM

Allan L. Oberstadt, Rochester, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sept. 30, 1974, Ser. No. 510,276
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **7 Claims**



1. In a fuel management system for an internal combustion engine having an exhaust gas sensor for supplying a control signal to the fuel management control, a detection system for detecting when the temperature of the sensor is at its operating temperature to provide an enabling signal to the fuel management control system, said system comprising:

an exhaust gas sensor operable at a high sensor temperature for generating a first voltage signal in response to the absence of a predetermined constituent gas in the exhaust gas and for generating a second voltage signal in response to the presence of the predetermined constituent gas in the exhaust gas, said sensor having an internal impedance varying inversely with the temperature of said sensor from a very high impedance at its low, nonoperable temperature to a very low impedance at its high operating temperature;

an exhaust gas sensor amplifier circuit means electrically connected to said sensor, the output signal of said circuit means normally having a first voltage level when said sensor's internal impedance is very high corresponding to the low temperature of said sensor and said circuit means adapted to switch said output signal between said first voltage level and a second voltage level in response to said first and second voltage signals from said sensor;

storage means electrically responsive to said first voltage level from said circuit means for storing at a predetermined charging rate a voltage magnitude representing the temperature of said gas sensor;

storage discharge means electrically connected to said storage means and operable for discharging said storage means at a predetermined discharging rate, in response to said second voltage level from said circuit means;

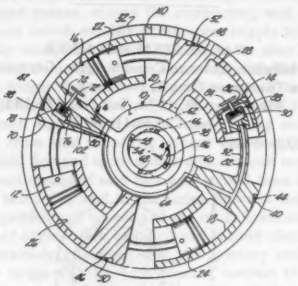
temperature reference signal means for generating a threshold voltage level representing the normal operating temperature of said sensor; and

a comparator having one input electrically connected to said storage means and another input electrically connected to said temperature reference signal means, the output of said comparator being an enabling signal when the magnitude of the voltage level of said storage means is greater than said threshold voltage level.

3,938,480
INTERNAL COMBUSTION ENGINE

Leon M. Yanda, Rte. No. 1, Box 45A, Augusta, Kans. 67010

Filed Feb. 4, 1974, Ser. No. 439,384
Int. Cl.² F02B 57/00
U.S. Cl. 123—43 B 18 Claims



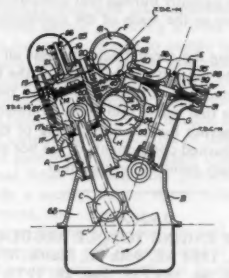
1. A reciprocating piston device comprising:
a. a shaft;
b. a plurality of rotor members mounted on said shaft for successive alternate rotational movements around said shaft;
c. a pair of oppositely disposed cylinders as a part of each said rotor;
d. a pair of oppositely disposed pistons as a part of each said rotor, each piston of one rotor being positioned for reciprocal movement within a cylinder of another rotor to form a circular arrangement of piston-cylinder assemblies;
e. inlet valve means for the introduction of fluid into each said cylinder;
f. outlet valve means for the removal of fluid from each said cylinder;
g. means for imparting said alternate movements to said rotors;
h. means for preventing rotation of a rotor in an angular direction opposite to that of the rotation of another rotor; and
i. conduit means extending from each said assembly and establishing respectively fluid connection with said valve inlet means of the cylinder oppositely disposed to said assembly and with said outlet means of the cylinder following said assembly in said circular arrangement to effect the opening of both said valve means in response to an increase in fluid pressure in the cylinder of said assembly.

3,938,481
TWO-STROKE INTERNAL COMBUSTION ENGINE

Clyde M. Morton, 11525 S. Ramona, Hawthorne, Calif. 90250

Filed Feb. 7, 1975, Ser. No. 547,790
Int. Cl.² F02B 1/08
U.S. Cl. 123—69 R 22 Claims

1. In a reciprocating two-stroke multiple cylinder internal combustion engine having a housing, a cylinder having a piston reciprocably mounted in the cylinder for movement alternately through compression and power strokes, said piston forming one end of a combustion chamber area when the piston is at top dead center, said cylinder having multiple exhaust ports through said cylinder wall and multiple scavenging air ports into said cylinder chamber, a supply port to said cylinder chamber for a fuel-air mixture, a pressure retaining chamber between said supply port and said cylinder chamber, and a pressure retaining valve means between said pressure retaining chamber and said cylinder chamber biased normally to closed position against pressure in said pressure retaining chamber, a fuel-air mixture supply line to said supply port including means for keeping said supply line under pressure, a continuously acting rotary metering pressure booster in said supply line having a metered capacity sufficient to fill said cylinder chamber when said piston is at the bottom of the stroke, a scavenging air line to said multiple scavenging ports including means for keeping said scavenging air line under pressure and a continuous acting rotary metering pressure booster in said scavenging air line having a metered capacity

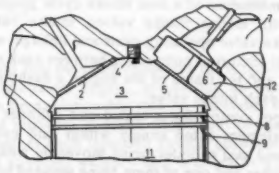


slightly in excess of said cylinder chamber when said piston is at bottom end of stroke, said second recited means being operable to cycylically supply scavenging air to said cylinder chamber at the end of the power stroke, said multiple exhaust and multiple scavenging ports being subject to opening and closing in response to movement of said piston, said rotary metering pressure boosters and said piston being operable in timed sequence to feed fuel-air mixture and scavenging air to said cylinder chamber sequentially.

3,938,482
INTERNAL COMBUSTION ENGINE WITH A PLURALITY OF EXHAUST VALVES

Hideaki Akamatsu, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 27, 1973, Ser. No. 419,238
Claims priority, application Japan, Oct. 16, 1973, 48-116190
Int. Cl.² F02B 75/02
U.S. Cl. 123—75 C 6 Claims



1. A four-stroke cycle internal combustion engine of the type having a combustion chamber, carburetor means for introducing a combustible mixture of fuel and air into the chamber, a cyclically movable power member fitted in the chamber for expanding the effective volume of the chamber from a minimum value to a maximum value in response to combustion of the mixture, a fixed volume exhaust passage opening from the chamber, an exhaust manifold connected to the exhaust passage for conducting the exhaust gases from the combustion chamber to the outside atmosphere, a first exhaust valve postioned in the opening of the exhaust passage for passing all of the gases exhausted from the chamber into the exhaust passage, and means for opening the first exhaust valve during a predetermined portion of each cycle of power member movement commencing prior to the completion of

the expansion stroke of the power member, wherein the improvement comprises:

a second exhaust valve arranged in the exhaust passage and spaced downstream from the first exhaust valve by a distance sufficient to form a fixed volume secondary combustion chamber in the exhaust passage sized smaller than the combustion chamber to hold a predetermined initial fraction of the flow of the exhaust gases from the combustion chamber that contain a high proportion of unburned and partially burned fuel components from the region adjacent to the walls of the combustion chamber and

means for opening the second valve to pass all of the gases admitted to the exhaust passage through the first valve to the exhaust manifold at a predetermined time after the opening of the first valve, said predetermined time being sufficient to permit further combusting of the unburned and partially burned components of the hot exhaust gases in the secondary combustion chamber.

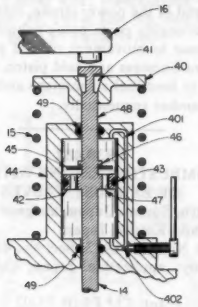
3,938,483
GASOLINE ENGINE TORQUE REGULATOR

Joseph Carl Firey, 1554 NE. 95th St., Seattle, Wash. 98115

Division of Ser. No. 389,715, Aug. 20, 1973, Pat. No. 3,855,526. This application Dec. 23, 1974, Ser. No. 536,969

Int. Cl.² F01L *9/02*

U.S. Cl. 123—90.12 **13 Claims**



1. The combination of a four stroke cycle gasoline engine, complete with engine intake valves, intake valve closing springs, intake valve operating cams and linkage, wherein the improvement comprises connecting between each such engine intake valve and the frame of the engine a dashpot, one such dashpot for each intake valve;

said dashpot comprising a sealed end cylinder element, a piston element fitted snugly within said cylinder, said piston and said cylinder being moveable with respect to one another and one of them being secured to the engine frame with the other being secured to the engine intake valve, the two chambers of the cylinder created by the presence of the piston therein being filled with fluid and being sealed against leakage and being connected to each other by two flow passages, in one of which flow passages a one way check valve is placed and in the other of which flow passages an adjustable flow restriction is placed, said one way check valve opening fully to allow ready fluid flow between the two chambers of the cylinder when the engine intake valve is being opened by the intake valve operating cams and linkage but closing fully to stop fluid flow in the check valve equipped flow passage when the engine intake valve is being closed by the force of the valve closing spring so that fluid flows between the two chambers of the cylinder during the closing of the valve only through the flow passage containing the adjustable flow restriction; the closing of the engine intake valve being thus adjustably delayed, by delay of fluid flow through the flow restriction, beyond the usual intake valve closing time, said closing of the engine intake valve not to be delayed beyond the time of firing of the engine ignition spark by providing a minimum available restriction area in the flow restriction.

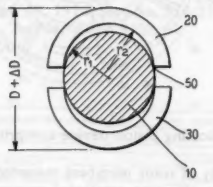
3,938,484
VALVE STEM RETAINER

Reinhard Müeller, Lauenau Copenbrugger, Germany, assignor to Teves-Thompson GmbH, Germany

Filed May 20, 1974, Ser. No. 471,185

Int. Cl.² F01L *3/10*

U.S. Cl. 123—90.67 **3 Claims**



1. A valve lock retainer assembly comprising a pair of valve retainer lock segments, each of said segments having a radius of curvature less than the radius of curvature of a valve stem about which segments are to be received, at least one of said segments being deformed into mating engagement with said valve stem and providing frictional engagement as a result of elastically stored strain energy in said segment, each of said segments having a radius of curvature greater than 0.98 times but less than 0.995 times the radius of said valve stem.

3,938,485
IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

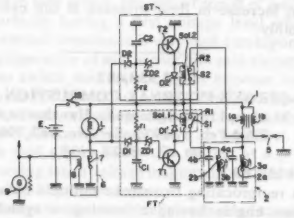
Koji Yoshizu, and Kingo Okitsu, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed Apr. 17, 1974, Ser. No. 461,801

Claims priority, application Japan, Apr. 24, 1973, 48-48878[U]

Int. Cl.² F02P *5/04*; F02N *17/00*

U.S. Cl. 123—117 R **4 Claims**



1. An ignition system for an internal combustion engine having ignition coil means including a primary and a secondary coil, ignition plug means connected with the secondary coil of the ignition coil means, an electric power supply means connected with one end of the primary coil of the ignition coil means, and breaker means connected at one end with the other end of the primary coil, the other end of the breaker means being grounded, the breaker means including at least two breaker contacts connected in parallel to the other end of the primary coil, one of the contacts being opened at a normal engine ignition timing and the other being opened at a timing

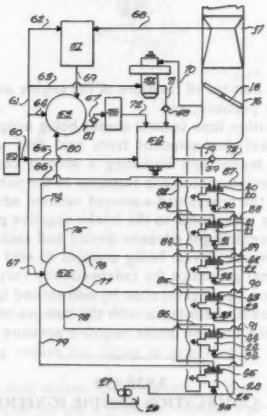
later than the one breaker contact by a preselected time to retard engine ignition, comprising: a first time delay circuit means including a normally open switch contact means, means for connecting said normally open contact means to the power supply to energize said normally open switch contact means for closing same after a first predetermined time delay; a second time delay circuit means including a normally closed switch contact means, means for connecting said normally closed contact switch means to the power supply to energize said normally closed switch for opening same after a second predetermined time delay, said second predetermined time delay being longer than said first predetermined time delay; means for detecting that the engine is started and producing an engine start signal; and means for receiving said engine start signal from said detecting means and simultaneously energizing said first and second time delay circuit means, said switch contact means of said first and second time delay circuit means being disposed in the series between the primary coil of the ignition coil means and the other breaker contact, whereby after engine start, said first and second circuit means are simultaneously energized and the primary coil is connected in a series with the one breaker contact to produce engine ignition at the normal ignition timing during said first predetermined time delay after which said normally open contact means is closed to establish a series connection between the primary coil and the other breaker contact to produce engine ignition at a delayed timing for a time until said second predetermined time delay has elapsed, which time is the difference between said first and second predetermined time delays, and thereafter said normally closed switch contact means is opened to again establish a series connection between the primary coil and the one breaker contact to again produce engine ignition at the normal ignition timing.

3,938,486

PNEUMATICALLY CONTROLLED FUEL INJECTION SYSTEM

Cecil D. Oglesby, Manchester, Mo., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 18, 1974, Ser. No. 461,829
Int. Cl.² F02B *33/00*
U.S. Cl. 123—119 R **3 Claims**



1. A pneumatically controlled fuel injection system for an internal combustion engine having air induction passages defining a venturi portion and a manifold portion, said system including,

a pneumatic fluid source,

a pneumatically actuated fuel injector connected to said pneumatic source and in fluid communication with a source of fuel and with said manifold portion of said engine, said injector being operable to admit fuel to said manifold portion in response to a pneumatic control pulse,

a control device communicating with said pneumatic source and with said injector including means for initiating said control pulse in response to a trigger signal and for sustaining said control pulse for a time interval inversely proportional to a bias pressure,

trigger signal generating means connected to said engine and communicating with said pneumatic source and with said control device providing a train of trigger signals having a frequency related to engine speed, and

bias pressure generating means communicating with said pneumatic source and with said control device including;

a first pneumatic circuit portion connected to receive a signal from said venturi portion and adapted to provide a first output signal indicative of fuel requirement,

a second pneumatic circuit portion connected to receive a signal from said manifold portion and adapted to provide a second output signal indicative of fuel requirement, and

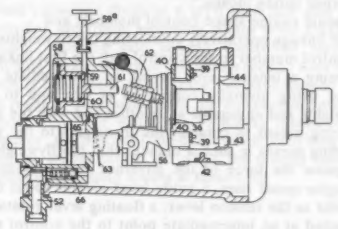
comparator means connected to said first and second circuit portions and to said control device providing said bias pressure proportional to one of said first or second output signals indicative of fuel requirement.

3,938,487

LIQUID FUEL PUMPING APPARATUS

Pierre Henri Peltret, London, England, assignor to C.A.V. Limited, Birmingham, England

Filed Jan. 25, 1974, Ser. No. 436,813
Claims priority, application United Kingdom, Feb. 3, 1973, 5467/73
Int. Cl.² F02M *59/42*
U.S. Cl. 123—139 ST **5 Claims**



1. A liquid fuel pumping apparatus for supplying fuel to an internal combustion engine, comprising an injection pump operable in time relationship with an associated engine, a fuel control rod movable to effect adjustment of the quantity of fuel supplied at each injection stroke, governor mechanism including a governor weight which is driven at a speed dependent upon the speed of the associated engine, a member movable by the weight, a governor spring for opposing movement of the member as the speed of the engine increases, operator adjustable means for adjusting the force exerted by the spring, link means connecting said member with the fuel control rod whereby for a given setting of the operator adjustable means, as the engine speed increases, the fuel control rod will be moved to reduce the amount of fuel supplied to the apparatus, a releasable actuator which, when released, acts to effect movement of the control rod to an excess fuel position, said actuator including a coiled compression spring, a piston which can be subjected to fluid pressure in order to compress the spring, a spring loaded pin to retain the piston, with the pin being operable from the exterior of the apparatus when excess fuel is required, a pivotal arm which can be engaged by said piston when said pin is released, with said arm pivoting under the action of said compression spring and engaging with part

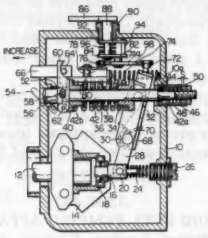
of said link means to effect movement of the control rod to the excess fuel position, a maximum fuel stop which acts to limit the movement of the control rod in the direction of increasing fuel during normal operation of the apparatus, and said pivotal arm having means for rendering said maximum fuel stop inoperative prior to the engagement of the arm with said part of the link means.

3,938,488

DIESEL ENGINE FUEL INJECTION PUMP GOVERNOR

Hachiro Aoki, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 22, 1974, Ser. No. 472,330
Claims priority, application Japan, June 1, 1973, 48-63929
Int. Cl.² F02D *1/04*
U.S. Cl. 123—140 R **11 Claims**



1. A governor for an engine fuel injection pump comprising:
a fuel control rod adapted to be connected to the fuel injection pump to control the fuel injection volume;
flyweights;
governor spring means;
a manual engine speed control member; and
a first linkage operatively connecting the flyweights and the control member to the control rod, the first linkage comprising a tension lever having an intermediate fulcrum and being pivotally connected at one end to the flyweights and engagable at its other end with the governor spring means to connect the flyweights to the governor spring means in such a manner that the flyweights move against the force of the governor spring means as the engine speed rises, a guide lever pivotal about the same point as the tension lever, a floating lever rotatably connected at an intermediate point to the control member, the floating lever being pivotally connected at one end to the end of the guide lever and being pivotally connected at its other end to the control rod, and biasing means urging the guide lever to rotate with the tension lever, the biasing means normally operatively maintaining the guide lever in engagement with the tension lever and being arranged to yield and allow the tension lever to disengage from the guide lever when the control member is in a low engine speed demand position and the engine speed is above a predetermined value.

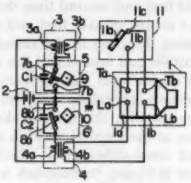
3,938,489

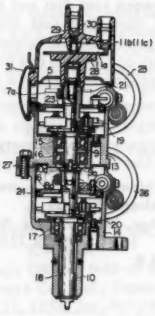
IGNITION SYSTEM FOR TWO-CYLINDER ENGINES

Yoshiaki Takeda, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 382,112, July 4, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,279
Claims priority, application Japan, July 31, 1972, 47-77158
Int. Cl.² F02P *7/10, 15/02*; F02B *53/12*
U.S. Cl. 123—148 DS **7 Claims**

1. An ignition system for a two-cylinder engine comprising a first ignition signal generator, a first ignition coil controlled by said first ignition signal generator, a first pair of spark plugs connected in series with said first ignition coil, a second ignition signal generator operable independently of said first ignition signal generator to generate ignition signals at time instants different from those of said first ignition signal generator, a second ignition coil controlled by said second ignition signal generator, a second pair of spark plugs connected in series with said second ignition coil,
a first ignition time control means including a first centrifugal advance device operable in response to the number of rotations of the engine and a first vacuum advance device operable in response to an intake negative pressure, said first centrifugal advance device and said first vacuum advance device being coupled to said first ignition signal generator for varying the time of ignition signal generation by said first ignition signal generator in accordance





with the number of rotations of the engine and the intake negative pressure, and
second ignition time control means being adapted to operate entirely independent from said first ignition time control means and including a second centrifugal advance device operable in response to the number of rotations of the engine and a second vacuum advance device operable in response to the intake negative pressure, said second centrifugal advance device and said second vacuum advance device being coupled to said second ignition signal generator for independently varying the time of ignition signal generation by said second ignition signal generator in accordance with the number of rotations of the engine and the intake negative pressure.

3,938,490

INTERNAL COMBUSTION ENGINE IGNITION SYSTEM FOR GENERATING A CONSTANT IGNITION COIL CONTROL SIGNAL

Larry D. Snyder, San Jose, and Robert B. Hood, Los Altos, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed July 15, 1974, Ser. No. 488,883
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 E **10 Claims**

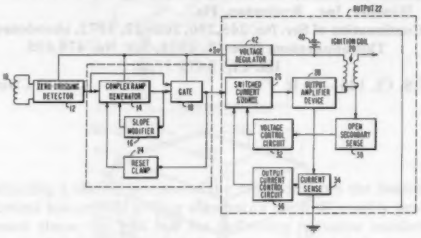
1. In combination with an engine having an ignition coil and

a distributor for supplying an alternating signal, an ignition system comprising:

first means responsive to said alternating signal and operative to generate a first timing signal;

second means responsive to said first timing signal and operative to generate a second timing signal;

third means responsive to said first and second timing signals and operative to generate a constant ignition coil



control signal over the normal operating range of said engine so as to effectively minimize the power expended by said ignition system, said control signal having a start transition controlled by said second timing signal and an end transition controlled by said first timing signal; and,

fourth means responsive to said control signal and operative to control the charging and discharging of said ignition coil.

3,938,491

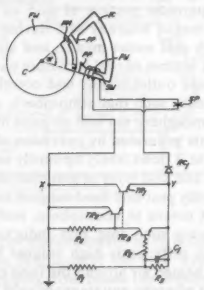
SWITCHING CIRCUIT FOR IGNITION SYSTEM

Benito Marcel Mazza, Ville St. Laurent, Canada, assignor to Terry Industries, Pointe Claire, Canada

Filed Apr. 29, 1974, Ser. No. 464,904

Int. Cl.² F02P *1/02*

U.S. Cl. 123—149 C **7 Claims**



1. An ignition system for internal combustion engines comprising:

a. sparking means for firing in response to said ignition system;

b. ignition coil means for generating a high voltage, said ignition coil having a primary winding and a secondary winding, said secondary winding being connected to said sparking means;

c. magnetic means for linking magnetically with said ignition coil means, said magnetic means being adapted to be moved relative to said ignition coil means and thereby to induce a voltage and current in said primary winding;

d. a first controlled electronic switching means having a controlled electrode for controlling current flow through a first switching path of said first switching means, said first switching path being in the circuit of said primary winding;

e. a second controlled electronic switching means having a controlled electrode for controlling current flow through a second switching path of said second switching means, said second switching path being connected to the controlled electrode of said first controlled electronic switching means;

f. a conduction path through said second switching means between said controlled electrode of said second controlled electronic switching means and one side of said second switching path;

g. a first resistor, having two terminals, connected, at one terminal thereof, to said controlled electrode of said second controlled electronic switching means;

h. a second resistor and a capacitor, connected in parallel arrangement between a second terminal of said first resistor and said one side of said second switching path; and

i. a third resistor connected between said second terminal of said first resistor and a ground point;

whereby, said first controlled electronic switching means will be biased into conduction at the onset by said induced voltage, and the second controlled electronic switching means will be non-conductive;

and said capacitor will be charged by said induced voltage through said third and second resistors to bias said second controlled electronic switching means on after a first time interval which is dependent on the time constant formed by said third resistor, said second resistor and said capacitor, the change in state of said second controlled electronic switching means when it is turned on causing said first controlled electronic switching means to be turned off;

said capacitor being discharged, when said second controlled electronic switching means is turned on, through said first resistor and said conduction path of said second controlled electronic switching means, so that the voltage of said capacitor drops to a level such that said second controlled electronic switching means is no longer conductive, whereby said second controlled electronic switching means is turned off, after a second time interval which is dependent on the time constant formed by the first resistor, the resistance of the conduction path of the second controlled electronic switching means and the capacitor, the first controlled electronic switching means being no longer turned off when the second controlled electronic switching means is turned off.

3,938,492

OVER THE WHEEL DRESSER

Norman Joseph Mercer, Jr., Hillsdale, Ill., assignor to Boyar Schultz Corporation, Broadview, Ill.

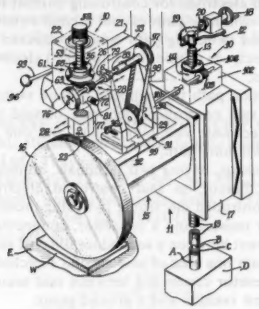
Division of Ser. No. 394,506, Sept. 5, 1973. This application June 17, 1974, Ser. No. 479,603

Int. Cl.² B24B *53/04*

U.S. Cl. 125—11 R **3 Claims**

1. A wheel dresser assembly for a surface grinder, said assembly comprising a dresser elevation head, an elevating screw held in said head and having means for receiving and holding a dressing tool, means holding said screw in said head against rotation but permitting longitudinal dressing tool adjusting movement of the screw in said head, coarse adjusting means for moving the screw longitudinally to effect a first adjustment of the position of the tool, fine-feed adjusting means movable into and out of effective position for a fine longitudinal adjustment of the screw, and means included in the fine-feed adjusting means for disabling the coarse adjusting means when the fine-feed adjusting means is in its effective position, wherein the screw is held in said head by a nut through which the screw is threaded; a worm wheel secured

to the nut, a gearing assembly included in the fine-feed adjusting means, said gearing assembly having a worm, and means



mounting the assembly for movement to bring the worm into and out of engagement with the worm wheel.

3,938,493

APPARATUS FOR GRILLING WITH HEAT STORING ARRANGEMENT

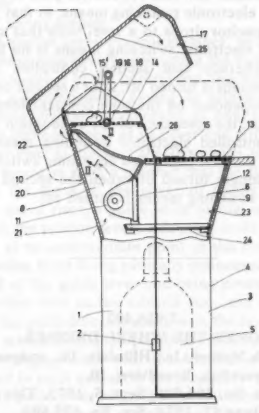
Hans Bauer, Gutenbergerstr, 20, 7311 Dettingen, Germany

Filed Jan. 28, 1974, Ser. No. 437,211

Claims priority, application Germany, Feb. 9, 1973, 2306347

Int. Cl.² A47J *37/00*; F24B *3/00*

U.S. Cl. 126—41 R **3 Claims**



1. In a grilling apparatus which includes (a) a grill basin having forward and rear walls, (b) a heating element, grilling grate and heat-retaining warming storage grate operatively associated in the grill basin, (c) a hood having depending forward and rear walls defining a hollow channel opening toward the grill basin, and (d) means for pivotally mounting the hood to the grill basin for movement between a closed position and a fully open position with respect to the grill basin, the pivotal mounting means being located so that the rear wall of the hood overlaps the rear wall of the grill basin when the hood is pivoted away from the closed position, the pivotal mounting means comprising means for stably supporting the hood in a desired position intermediate the closed position and a fully open position, the improvement wherein the rear wall of the grill basin has openings therethrough for passage of a heated air stream out of the grill basin, whereby the overlapping portion of the hood chamber receives the heated air stream exiting from the rear wall of the grill basin via at least one of the openings therein when the hood is in an open position.

3,938,494

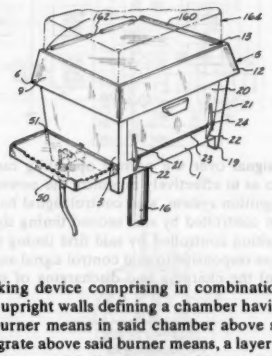
COOKING APPARATUS

Morton L. Clark, Bradenton, Fla., assignor to Guaranteed Weather, Inc., Bradenton, Fla.

Continuation of Ser. No. 265,296, June 22, 1972, abandoned. This application June 12, 1974, Ser. No. 478,695

Int. Cl.² A47J *37/06*

U.S. Cl. 126—41 R **42 Claims**



1. A cooking device comprising in combination an enclosure having upright walls defining a chamber having a top and a bottom, burner means in said chamber above said bottom, a perforate grate above said burner means, a layer of perforate incombustible material disposed on said grate adapted to be heated by said burner means to incandescence in at least a narrow portion thereof directly over said burner means, a cover for closing the top of said chamber, means for supporting food to be cooked above said grate and adapted to allow heated air to rise past the food, gaseous fluid outlet means extending along said upright walls of said enclosure spaced below the uppermost portion of said cover and above said food support means whereby said device is vented to atmosphere through said outlet means, and air inlet means in the vicinity of said bottom of said enclosure having an area greater than that of said outlet means and correlated therewith and said burner means such that atmospheric air is inducted from the outside atmosphere via said air inlet means solely by convection currents generated by operation of said burner means and is heated as it flows freely upwardly sequentially past said burner means and said layer of material, the heated air thence flowing upwardly past said food support means and outwardly via said outlet means to atmosphere, said inlet-outlet-burner correlation being such that said inducted air flows at low velocity but in sufficiently high volume to cause a constant circulation of heated air around the food cooking on said food support means whereby any stagnant cold layer of air adjacent the food is stripped away by said flowing air to thereby effect more efficient radiant and convection heating of the food.

3,938,495

GRILLING APPARATUS WITH SUPPORTING SURFACE

Hans Bauer, Dettingen, Germany, assignor to Hans Bauer, Dettingen, Germany

Filed Sept. 11, 1974, Ser. No. 505,001

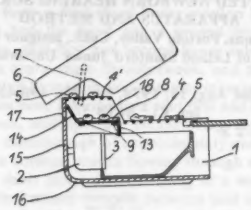
Claims priority, application Germany, Sept. 14, 1973, 7333356

Int. Cl.² A47J *37/00*; F24B *3/00*

U.S. Cl. 126—41 R **3 Claims**

1. In a grilling apparatus, a grill tub containing a heating element, a grilling element supported transversely to and above the heating element and forwardly thereof, a bowl have

a closed, food supporting bottom surface exhibiting a pattern of indentations and mounted independently, directly above the heating element and transverse to the grilling element, the bottom surface of the bowl being directly heated by a first portion of the radiation from the heating element, means for



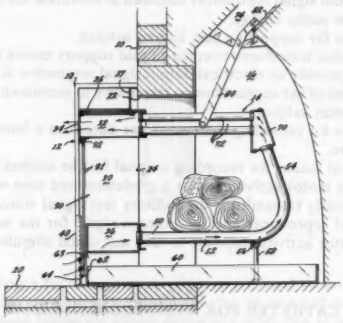
deflecting a second portion of the radiation from the heating element toward the grilling element, a hood adjustably positioned above the grill tub for deflecting radiation incident thereon downwardly toward the bowl, and means including an aperture in one wall of the grill tub for directing a flow of heated air from the heating element toward the hood.

3,938,496

FIREPLACE FORCED AIR CIRCULATION MEANS

William M. Kampf, Rancho Santa Fe, and Denny B. Law, San Marcos, both of Calif., assignors to Aquappliances, Inc., San Marcos, Calif.

Filed Dec. 26, 1974, Ser. No. 536,566
Int. Cl.² F24B 7/00
U.S. Cl. 126—121 7 Claims



1. Forced hot air circulation means to be installed in a room having a convention fireplace of the type having a firebox, having a hearth extending from inside the firebox to an outside hearth area in front of and wider than said firebox to extend to each side of said firebox, and having facings above and to the sides of said firebox, comprising:

a. a generally box-shaped sheet metal outer housing resting on said outside hearth area in front of said firebox and lapping at least the margins of said facings above said firebox and said facings to the sides of said firebox,

b. said housing having sidewalls aligned with and disposed in vertical planes normal to said facings to the sides of said firebox,

c. said housing having means supported between said sidewalls in the upper portion of said housing including a chamber located at least mostly outside of said firebox with air outlet means at its front to exhaust air into said room,

d. said housing having means supported between said sidewalls in the lower portion of said housing including an air ingress manifold located at least mostly outside of said firebox, and at least one blower located outside of said firebox having an inlet for room air and exhausting into said air ingress manifold,

e. said housing having an open central housing portion in front of said firebox and located between said chamber and said manifold and between said sidewalls and providing access to and viewing of said firebox, and

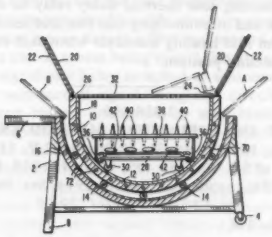
f. spaced, juxtaposed tubular means connected to said housing and including first lower generally horizontally disposed tubular portions connected to said manifold at their forward ends to receive air therefrom and extending rearwardly into said firebox defining a grate, second air transferring means connecting to the rear ends of said first tubular portions and extending upwardly to the upper portion of said firebox, and third upper tubular portions connecting to the upper end of said second air transferring means and extending forwardly and connecting to the rear of said chamber for exhausting of air to said room, thereby delivering a flow of heated air when a fire burns in said firebox.

3,938,497

APPARATUS FOR SOLAR COOKING

Stella Andrassy, Ridge Road, Kingston, N.J. 08528

Filed Dec. 10, 1974, Ser. No. 531,279
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 4 Claims



1. A solar cooking oven comprising

a. a frame;

b. an oven of concave configuration tiltably mounted on said frame to afford maximum exposure of the interior of the oven to solar radiation;

c. an article support located in said oven adjacent the center thereof;

d. and rollers located between said oven and article support to permit movement of said support to a horizontal position in any tilted position of said oven.

3,938,498

CONTROL SYSTEM FOR FRYING APPARATUS

George M. Price, Shreveport, La., assignor to The Frymaster Corporation, Shreveport, La.

Division of Ser. No. 479,661, June 17, 1974, Pat. No. 3,870,859. This application Feb. 18, 1975, Ser. No. 550,350
Int. Cl.² A47J 27/00
U.S. Cl. 126—374 1 Claim

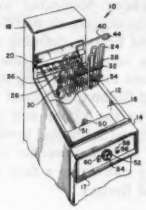
1. In a food frying system the combination comprising:

a plurality of heater elements adapted for connection to a power source for heating cooking fluid in said system, said elements being pivotally attached to said system to rotate from a first position in said cooking fluid to a second position out of said fluid,

a first thermostat selectively electrically connected to said heating elements for maintaining said heating elements at a selected cooking temperature,

a second thermostat attached to and in selective electrical connection with said heating elements for turning off said elements when said elements reach a first predetermined temperature while in said first position,

a third thermostat attached to and in electrical connection with said heating elements for turning off said elements when said elements reach a second predetermined temperature while in said second position,



a thermal delay relay selectively connected to said heating elements for cycling said heating elements off and on while said elements are in said second position; and

a switch in said system for alternately connecting said first and second thermostats to said heating elements and disconnecting said thermal delay relay from said heating elements when said elements are in said first position and for connecting said thermal delay relay to said heating elements and disconnecting said first and second thermostats from said heating elements when said elements are in said second position.

3,938,499

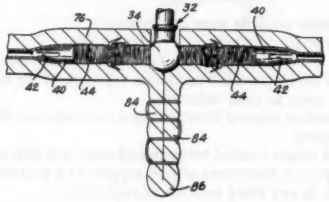
IMPLANT AND IMPLANTING METHOD AND TOOL

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Division of Ser. No. 359,429, May 11, 1973, Pat. No. 3,815,578. This application Feb. 5, 1974, Ser. No. 439,836

Int. Cl.² A61B *17/11, 19/00*

U.S. Cl. 128—1 R **1 Claim**



1. In a method for introducing a valve having an intermediate portion and tubular extensions respectively extending in opposite directions from said intermediate portion into a vas deferens of a living being, the step of removing a part of the vas deferens extending outwardly from the lumen thereof at only one side of the lumen so as to leave at the vas deferens a continuous portion extending between free ends of the lumen which are exposed by removing said part thereof, introducing the tubular extensions into the free ends of the lumen, respectively, deflecting the continuous portion of the vas deferens away from the lumen thereof to advance the free ends of the lumen toward the intermediate portion of the valve for pulling the vas deferens onto the opposite tubular extensions, forming from the deflected continuous portion of the vas deferens a pair of flaps which engage each other, which remain connected to each other at their outer ends which are distant from the lumen, and which project laterally from the lumen, and fastening the flaps together so that they will grow together and maintain the free ends of the lumen adjacent the intermediate portion of the valve.

3,938,500

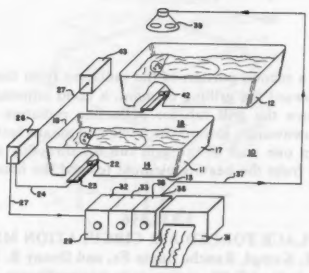
AUTOMATED NEWBORN HEARING SCREENING APPARATUS AND METHOD

F. Blair Simmons, Portola Valley, Calif., assignor to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Aug. 19, 1974, Ser. No. 498,450

Int. Cl.² A61B *5/12*

U.S. Cl. 128—2 Z **9 Claims**



1. In a hearing screening apparatus of the type for measuring hearing of a human subject by measuring the change in subject motor activity in response to an unexpected auditory stimulus, the apparatus comprising,

an audio signal reproducer disposed to stimulate the subject with audio energy,

means for supporting said human subject,

a motion transducer coupled to said support means serving to provide an electrical output signal responsive to movement of the support means responsive to movement of the human subject,

means for recording the transducer output as a function of time,

control means for recording a signal for the subject's baseline motor activity and at a predetermined time simultaneously transmitting an auditory test signal stimulus via said reproducer and recording a signal for the subject's motor activity response to said test signal stimulus.

3,938,501

CATHETER FOR RADIOLOGICAL RENAL AORTOGRAPHY AND SELECTIVE ARTERIOGRAPHY

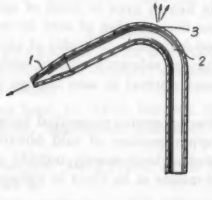
Uno Eugen Erikson, Uppsala, Sweden, assignor to Siemens Aktiengesellschaft, Germany

Filed Nov. 1, 1973, Ser. No. 411,815

Claims priority, application Sweden, Nov. 3, 1972, 253/72

Int. Cl.² A61B *6/02*

U.S. Cl. 128—2 A **5 Claims**



1. Catheter for the injection of liquid X-ray contrast media into the vascular system of a patient for the implementation of

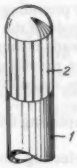
renal aortography and selective arteriography comprising a flexible tubular catheter member, one end of said catheter member terminating into a tapered point having an opening communicating with the interior of the catheter and adapted to be introduced into the patient, said catheter member being bent through a predetermined angle in proximity to said point end so as to form a first short linear portion between said tapered point and the bend and a second lengthier linear tubular portion, said first and second linear tubular portions subtending an acute angle therebetween, and through aperture means being formed in said catheter member in the central region of its bend intermediate said first and second linear tubular portions, said aperture means being dimensioned to facilitate flow therethrough of approximately one-seventh the quantity of the contrast media flowing through said catheter, and said first short linear portion being of a length so as to provide a predetermined distance between said opening at the tapered point and said aperture means whereby said catheter is adapted to be positioned in the renal artery of the patient for concurrently effecting renal aortography and selective arteriography.

3,938,502

APPARATUS WITH A CATHETER FOR EXAMINING HOLLOW ORGANS OR BODIES WITH THE ULTRASONIC WAVES

Nicolaas Bom, Weidebloemstraat 33, Berkenwoude (Z.H.), Netherlands

Division of Ser. No. 334,300, Feb. 21, 1973, Pat. No. 3,827,115. This application May 9, 1974, Ser. No. 468,544
Claims priority, application Netherlands, Feb. 22, 1972, 7202282; Mar. 10, 1972, 7203176
Int. Cl.² A61B *10/00*
U.S. Cl. 128—2 V **19 Claims**



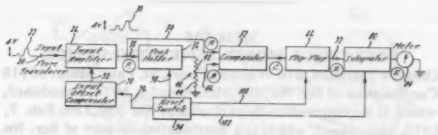
1. A device for examining a hollow organ, such as the heart, said device comprising a catheter having an axis and adapted to be placed inside the follow organ and including at an end, at least four circumferentially arranged, equidistantly distributed elements, each of which is adapted for the transmission and the reception of ultrasonic waves in successive transmission-reception periods, each of said elements having a width in a plane perpendicular to the axis of the catheter which is smaller than the wavelength of the ultrasonic waves such that they show substantially no directivity in a plane perpendicular to the axis of the catheter, the elements haveing axial dimensions which are larger than said wavelength, such that they do show directivity in a plane containing the said axis; an excitation device which successively excites groups of adjacently arranged elements at a rate of at least 25 times per second, each group having a center line; time delays for delaying the pulses transmitted and received during a transmission-reception period by the elements of a group so that the differences in travel times among the elements for the pulses to or from a plane perpendicular to the center line of the group are compensated; an adder for the summation of the echo pulses brought into coincidence by the time delays; and means controlled by the adder, for visually displaying the part of the examined hollow organ surrounding the catheter.

3,938,503

ACHILLES REFLEX TEST SYSTEM

Vincent A. Vis, Brighton, Mich., assignor to J. M. Richards Laboratories, Grosse Pointe, Mich.

Filed Sept. 3, 1974, Ser. No. 502,718
Int. Cl.² A61B *5/16*
U.S. Cl. 128—2 N **24 Claims**



1. A system for sensing the lapse of time between the peak contraction and the one-half relaxation point on a curve created by sensing the displacement of a foot in response to tapping the achilles tendon of the foot, the resulting curve having at least a first and second peak component having first and second peaks, the system comprising transducer means positioned to respond to the displacement of the foot and generating the curve, means connected to said transducer means for detecting a characteristic of the first peak of the curve and generating a first signal in response thereto and detecting the same characteristic of the second peak and generating a second signal in response thereto, said characteristic being relaxation points defined by a ratio of the characteristic point amplitude to the peak amplitude of said first and second peak components, bi-stable circuit means connected to said detector means having a first and second stable state, said bi-stable circuit means being in said first state in response to said first signal and being switched to said second state in response to said second signal, integrator circuit means including output means connected to said bi-stable circuit means and responsive to said first and second stable states, said integrator circuit means timing the period between said first and second characteristic and providing an output thereof, and reset circuit means connected to said detector means, bi-stable circuit means and said integrator circuit means for resetting said various means subsequent to the occurrence of said second characteristic.

3,938,504

METHOD FOR MEASURING VAGINA DIMENSIONS

Ben Wade Oakes Dickinson, III, 2125 Broderick St., San Francisco, Calif. 94115, and Robert Wayne Dickinson, 40 Maplewood Drive, San Rafael, Calif. 94901

Filed Oct. 30, 1974, Ser. No. 519,081
Int. Cl.² A61B *5/10*
U.S. Cl. 128—2 S **1 Claim**

1. In a trial and error method for measuring the effective diameter of the vaginal sphincter muscle of an animal of the type having a vagina terminating at the posterior end in a normally closed vulva and at the anterior end in a normally closed cervix and having a vaginal sphincter muscle therebetween using a device with a nose cone portion having a rounded blunt free end mounted to an elongate handle, said nose cone portion including an intermediate ring of maximum diameter, the steps of

a. grasping one of said measuring devices by the handle and inserting the nose cone portion through the animal's vulva into the animal's vagina until said intermediate ring passes anterior to said sphincter muscle, and

b. repeating step (a) with different measuring devices having intermediate rings of successively increased diameters until a measuring device is tried which causes a marked build-up of resistance against anterior movement of the device upon contact of said intermediate ring with the sphincter muscle and a distinct release of the resistance after passage through the muscle.

3,938,505

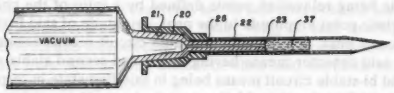
SOFT TISSUE BIOPSY ASPIRATING DEVICE

Khosrow Jamshidi, 610 Winston Court, St. Paul, Minn. 55118

Continuation of Ser. No. 497,903, Aug. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 330,320, Feb. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 261,818, June 12, 1972, abandoned. This application Mar. 27, 1975, Ser. No. 562,915

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2 B 6 Claims



1. Biopsy aspirating means for gathering soft tissue samples comprising:

a. syringe means having a barrel having a proximate end and a tip end, a plunger sealingly received within such barrel and forming a controllably variable volume chamber, an elongated sample-receiving hollow needle mounted upon said barrel, with said needle having a sharpened piercing tip at the outer end and a mounting hub at the inner end thereof, and needle mounting boss means formed integrally in one piece with said barrel as an extension thereof and being disposed at the tip end of said barrel and having a shank portion extending from the tip end of said barrel and having a means for receiving the mounting hub of said sample-receiving needle adjacent the tip end of said barrel;

b. a gripping shaft coupled to said plunger and extending outwardly from the proximate end of said barrel, guide plate means disposed at the proximate end of said barrel and having an opening formed therein to receive said gripping shaft, said gripping shaft having locking lug means formed thereon and arranged to releasably engage the outer surface of said guide plate means for restraining inward travel of said plunger when disposed at a position removed from said barrel tip end;

c. said needle mounting boss means terminating in an axially disposed sample abutment surface, an axial bore formed within said needle mounting boss and providing communication between the variable volume chamber of said barrel and the bore of said hollow needle shaft, said axially disposed abutment surface being received within the bore of said hollow needle and being disposed along said needle shaft at a point inwardly from the piercing tip end of said needle and toward the inner end thereof.

3,938,506

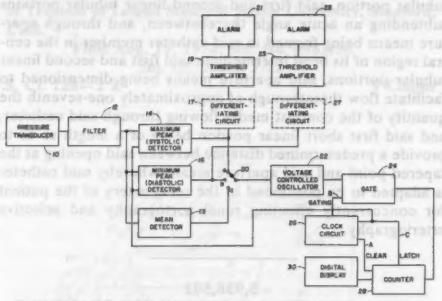
BLOOD PRESSURE MONITORING SYSTEM

Michael R. Birnbaum, New Brighton, and Louis C. Cosentino, Wayzata, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 5, 1974, Ser. No. 495,072

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 A 5 Claims



1. A system for monitoring the blood pressure of a patient, said system comprising:

a. transducer means adapted to be coupled to the vascular system of the patient for providing an output indicative of the patient's blood pressure;

b. filter means having a variable limit set in accordance with the patient's heartbeat for removing a high portion of the undesired frequency components from the output of said transducer means, the set limit being high with respect to the patient's heart rate, said filter means passing a high portion of the signal components of a frequency corresponding to the patient's heart rate;

c. systolic detector means responsive to the output of said transducer means for providing a first output indicative of the maximum magnitude of the patient's blood pressure;

d. diastolic detector means responsive to the output of said transducer means for providing a second output indicative of the minimum magnitude of the patient's blood pressure;

e. display means for displaying an indication of the patient's blood pressure;

f. switch means for selecting one of the first and second outputs to be displayed; and

g. processing means responsive to the magnitude of the selected output for providing an output indicative thereof for a selected period to said display means.

3,938,507

PORTABLE HEART MONITOR

Stanley J. Sarnoff, Bethesda; Herbert E. Reinhold, Jr., and Allan M. Wolfe, both of Rockville, all of Md., assignors to Survival Technology Incorporated, Bethesda, Md.

Filed Nov. 1, 1973, Ser. No. 411,843

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 B 32 Claims

32. Heart monitoring apparatus for use by a human user comprising:

a housing adapted in size and shape for holding by a human hand of said user,

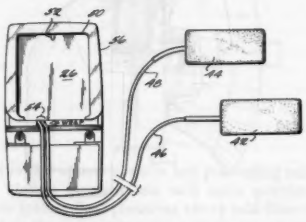
two electrodes physically connected via electrical leadwires with said housing, said electrodes being adapted for electrical contact at two respectively corresponding spaced-apart body areas of said human user,

circuit means disposed within said housing for receiving and processing electrical signals taken from the body of said user via said electrodes, said signals representing the functioning of a heart beating within the user's body and including output means for providing a sensible output indication corresponding to a predetermined characteristic of said electrical signals,

said circuit means including at least one differential amplifier means having two differential inputs respectively connected to receive electrical signals from a corresponding one of said electrodes,

said differential amplifier means also having a reference input for providing suppression of common mode noise appearing on said differential inputs when connected with a suitable reference electrical potential, and

an electrically conducting area disposed on the outside of the housing in a position normally in contact with said human hand when held thereby,



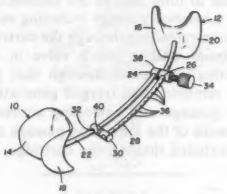
said electrically conducting area constituting a third electrode being electrically connected to said reference input for said circuit means whereby the user's body associated with said hand effectively becomes a source of electrical ground or reference potential when the housing is held in said hand thereby facilitating the suppression of spurious common mode electrical signals in said circuit means from said signals representing the functioning of a heart beating within the user's body.

3,938,508

ORAL APPLIANCE FOR BURN PATIENTS

Horst E. Buckner, R.R. No. 1, Iowa City, Iowa 52240

Filed July 26, 1974, Ser. No. 492,147
Int. Cl.[2] A61F 5/08
U.S. Cl. 128—76 R **8 Claims**



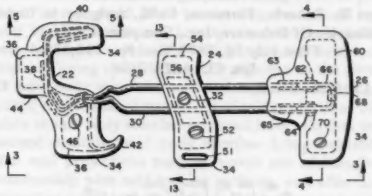
1. An oral appliance for treating patients with facial burns, said appliance comprising a pair of spaced-apart end members each having an outer wing and an inner wing joined together along a edge to form a concave-shaped end member with the wings extending outwardly away from the outwardly extending wings of the other end member, said end member being of a size to engage and fit the patient's lips only at opposite corners at the sides of the opening of the patient's mouth, and adjustable means connected to said end members at a place centrally of each of them and providing for adjustable relative movement between said end members to vary the distance between them, said adjustable means terminating at the place of connection to each said end member and lying entirely between said end members regardless of the relative position of said end members.

3,938,509

HAND SPLINT

Lois M. Barber, 5128 E. Ocean Blvd., Long Beach, Calif. 90803

Filed Dec. 9, 1974, Ser. No. 530,819
Int. Cl.[2] A61F 5/10
U.S. Cl. 128—77 **9 Claims**



1. A hand splint comprising:

a manually bendable support medium formed of a framework of metal, and having a pliant cushioning material enclosing at least the major portions of said framework;

said splint including as major pieces,

a palm piece, a distal piece and a proximal piece;

said palm, distal and proximal pieces being substantially arcuate in shape; and wherein,

said palm piece includes a palm support portion which is adapted to lie proximally to the distal palmar crease; and wherein;

said distal piece is angularly oriented relative to the longitudinal axis of an arm, is adapted to provide radial and ulnar contact, the radial contact being closer to the hand than the ulnar contact;

at least one longitudinally oriented connecting wires joining said major splint pieces; and,

straps attached to said hand splint to secure it to a hand and forearm.

3,938,510

FINGER SPLINT WITH TRACTION MEANS

Edward M. Gerber, 12 Carriage Drive, Lexington, Mass. 02173

Filed Aug. 5, 1974, Ser. No. 494,525
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—85 **11 Claims**

1. An article for use in the treatment of an injured finger or the like comprising:

an elongate splint having an outer forwardly extending end;

an attachment member having a first portion attached to the outer end of the splint, said member including an upwardly extending end portion extending from said first portion of said attachment member, said member being flexible to enable said end portion to be flexed with respect to said first portion of the member and splint in a direction which is forwardly and away from the end of said finger;

finger attaching means connected to the upwardly extending end portion of said member and adapted to extend generally rearwardly therefrom for attachment to said finger; and

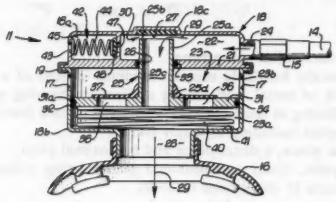
means for urging the upwardly extending end of the member in a generally forward direction and away from the end of the finger to a tensioned position.

3,938,511

MOUTHPIECE REGULATOR FOR AN UNDERWATER BREATHING APPARATUS

Robert E. Roberts, Torrance, Calif., assignor to Under Sea Industries Of Delaware, Inc., Compton, Calif.

Filed July 26, 1974, Ser. No. 492,058
Int. Cl.[2] A62B 7/04
U.S. Cl. 128—142.2 5 Claims



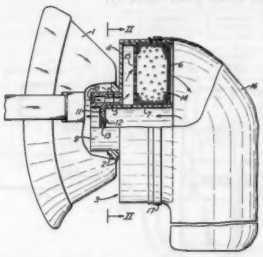
1. In the second stage regulator for scuba diving equipment:
a. a housing;
b. said housing having a partition dividing said housing into two compartments, namely, an inlet compartment and a control compartment;
c. a movable wall in the control compartment and dividing said control compartment into two separate chambers, namely an ambient chamber and a breathing chamber, the ambient chamber adjoining the inlet compartment;
d. a mouthpiece in open communication with the breathing chamber;
e. said movable wall having a relatively rigid tubular part open at both ends and fixedly, secured to said wall, one end of said tubular part being in continuous communication with said breathing chamber; said tubular part projecting through said ambient chamber through said partition and into said inlet compartment;
f. first seal means between said partition and said tubular part;
g. said housing having ports for admitting ambient fluid into said ambient chamber for exertion of pressure upon said movable wall;
h. spring means acting upon the wall and opposing the fluid pressure of said ambient chamber for urging said wall in a direction to project said tubular part through said partition; said spring means yielding to said ambient pressure upon a reduction of pressure in said breathing chamber;
i. second seal means in said inlet compartment and engaged by the other end of said tubular part to seal the tubular part;
j. means conducting breathable gases under pressure to said inlet compartment for passage through said tubular part and into said breathing chamber upon movement of said wall in a direction to move said tubular member from said second seal means;
k. means forming an exhalation valve from said ambient chamber;
l. said breathing chamber being otherwise sealed to confine flow to the tubular part, the mouthpiece, and the exhalation valve.

3,938,512

EMERGENCY BREATHING APPARATUS

John W. Mausteller, Evans City; Miles J. McGoff, Warrendale, and Daniel L. Thiebaud, Zelienople, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Division of Ser. No. 447,855, March 4, 1974, Pat. No. 3,893,459. This application Mar. 27, 1975, Ser. No. 562,866
Int. Cl.[2] A62B 7/08
U.S. Cl. 128—191 R 2 Claims



1. Emergency breathing apparatus comprising a mask having an open inner side and a closed outer side and provided with a breathing opening in said outer side, a chemical cartridge outside the mask provided with a side wall and with a rear wall having an opening therein surrounded by tubular means extending into said breathing opening and tightly engaging the surrounding mask for supporting the cartridge therefrom, said tubular means being formed from a tubular flange and a tubular boss having an outer wall, said outer wall and flange being disposed in tight overlapping engagement with each other, the flange extending from the rear wall of the cartridge into said breathing opening, a breathing bag provided with an opening receiving said cartridge, the bag being sealed to the side wall of the cartridge, the cartridge having an inhalation passage therethrough connecting the inside of the bag with said breathing opening, said passage having a side wall spaced radially inwardly from said cartridge side wall, the inside of the cartridge around the inhalation passage forming an exhalation passage provided with an inlet adjacent the inner end of the inhalation passage and with an outlet inside the bag, said boss having an inner wall inside its outer wall and spaced therefrom to form part of the exhalation passage, the side wall of the inhalation passage including said inner wall of the boss and a tube extending through the cartridge and tightly engaging said inner wall, a check valve in said inhalation passage preventing exhalation through that passage, and a carbon dioxide removing and oxygen generating chemical in said exhalation passage and extending across the space between the side walls of the inhalation passage and cartridge in the path of air exhaled through the cartridge.

3,938,513

SYRINGE FILTER AND VALVE COMBINATION

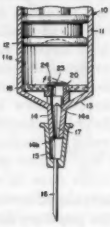
Thomas S. Hargest, 1078 Winslow Drive, Charleston, S.C. 29412

Filed Jan. 3, 1974, Ser. No. 430,418
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—218 R 11 Claims

1. A syringe having a barrel and a plunger slidable therein, said barrel having a cylindrical bore and having a bottom wall provided with an axially and downwardly projecting neck portion for rigid attachment to an injection needle, said neck portion having an axial flow passage communicating with said bore, wherein the improvement comprises

an annular filter element fixed within said bore adjacent said bottom wall, said filter element being formed from foraminous material capable of filtering objectionable particulate matter from injectable fluids, said filter ele-

ment having a central opening extending therethrough, and a tubular valve body secured within said central opening having an axial valve passage and having a normally-closed one-way valve closure element disposed at the upper end of said valve passage and spaced a substantial distance upwardly from said neck portion, said closure element being flexible between an open position and a normal closed position, and means bracing said closure



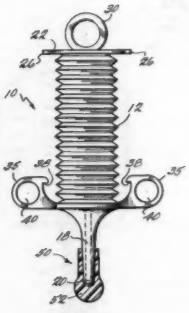
element in said closed position and preventing movement of said closure element into said open position in response to greater fluid pressures above said filter element than below the same, whereby, said closure element and said bracing means cooperate to block downward flow through said passage when said plunger is urged downwardly and to permit upward flow through said passage when said plunger is raised.

3,938,514

BLADDER WASH METHOD AND APPARATUS

Lionel J. Boucher, 747 Thibault, Sainte Therese, Quebec, Canada

Filed July 18, 1974, Ser. No. 489,717
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—232 **12 Claims**



1. Apparatus for aseptically washing the bladder of an individual having an indwelling catheter, said apparatus comprising

a. means for aseptically washing a bladder, for facilitating mechanical washing action of liquid in washing a bladder, and for preventing removal of too much liquid from a bladder, said means comprising (i) a hollow body member having the interior thereof prefilled with a predetermined amount of liquid for washing a bladder, and having first and second ends thereof, (ii) a tubular tip portion extending from said hollow body member at the first end thereof and adapted to be attached to said catheter to allow liquid communication between the bladder and the hollow body member but to prevent air from being admitted thereto, (iii) means for contracting and expanding the volume of said body member from a first position wherein said body member is prefilled with liquid, to a second position wherein substantially all of said liquid is expelled from said body member, to a third position wherein said liquid is drawn back into said body member and said body member is substantially filled, and (iv) means for releasably locking said body member in said second position thereof wherein said volume thereof is contracted and the prefilled liquid therein is substantially expelled therefrom, said means including a plate having a pair of projections thereon, said plate terminating the second end of said body member and located exteriorly of said body member, and a pair of locking surfaces, said locking surfaces being spaced from but adjacent to the first end of said body member, said locking surfaces being disposed in the path of movement of said projections of said plate as said body member is moved from said first to said second position, said body member being twistable so that said projections may be moved out of interferring relationship with said locking surfaces, and after having moved past said locking surfaces said body member being twistable back into its normal path of movement so that said plate projections abut said locking surfaces whereby said body member assumes said second position whereby movement of said body member from said second position to said third position is prevented, and

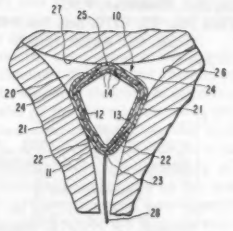
b. means for maintaining said prefilled volume of liquid within said body member until use thereof.

3,938,515

NOVEL DRUG PERMEABLE WALL

Harold M. Leeper, Mountain View, and Alan S. Michaels, Atherton, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 209,782, Dec. 20, 1971, abandoned. This application Oct. 19, 1973, Ser. No. 408,233
Int. Cl.[2] A61F *5/46, 13/20;* A61M *31/00*
U.S. Cl. 128—260 **7 Claims**



1. In a drug delivery device for continuously administering a drug at a controlled rate for a prolonged period of time to a body site, said device comprising a reservoir containing said drug and a carrier permeable to said drug, the amount of said drug being sufficient to maintain saturation within said carrier during said prolonged period, and a wall surrounding said reservoir which is permeable to the drug but at a rate less than that of the carrier, whereby the drug is released from the reservoir by diffusion through the wall in which the drug dissolves in the material forming the wall and moves therethrough in the direction of lower chemical potential, the improvement comprising forming the wall from a composition comprising a mixture of:

A. a polymer which is rubbery with a glass transition temperature below about 20°C, or is glassy having a glass transition temperature between about 20°C and about 150°C, or has a crystallinity between about 5% and about 95%; and

B. a polymeric additive which is essentially insoluble in body fluids, is nonvolatile and nonleachable and nonextractable from the polymer under the use conditions of

the composition and is selected from the group consisting of:

a. essentially linear olefinically saturated polyesters having a number average molecular weight of about 500 to about 8,000 of a diol of 2 to about 7 carbon atoms or polyethylene glycol and a dibasic carboxylic acid of about 6 to about 15 carbon atoms in which the terminating group is a carboxyacyl group of about 2 to about 18 carbon atoms or an alkoxy group of about 3 to about 15 carbon atoms;

b. polyethylene glycols of about 200 to about 1,500 molecular weight;

c. ethylene-vinyl acetate copolymers of about 20% to about 40% by weight vinyl acetate and about 20,000 to about 30,000 number average molecular weight;

d. chlorinated polyethylene of about 25% to 45% by weight chlorine and about 20,000 to about 30,000 number average molecular weight;

e. ethylene-ethylacrylate copolymers of about 20% to about 40% by weight ethylacrylate and about 20,000 to about 30,000 number average molecular weight; and

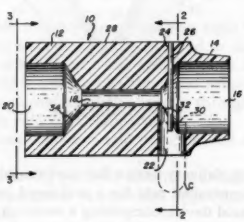
f. ethylene-vinyl chloride copolymers of about 25% to about 45% by weight chlorine and about 20,000 to about 30,000 number average molecular weight, the amount of additive in the mixture being sufficient to make the permeability of the composition of the drug substantially different than the permeability of the polymer to drug but less than the permeability of the carrier to drug, said composition being biologically compatible with the site, essentially non-erodible, essentially insoluble in body fluids, and, if the drug is highly water soluble, substantially impermeable to water to essentially prevent dilution of the drug by absorption of body fluids into the reservoir.

3,938,516

INHALATION DEVICE

Stanley Mathes, Mountain View, Calif., assignor to Syntex Puerto Rico, Inc., Humacao, P.R.

Filed Jan. 13, 1975, Ser. No. 540,917
Int. Cl.² A61M *13/00*
U.S. Cl. 128—266 **28 Claims**



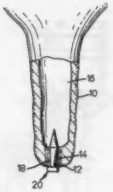
1. An inhalation device comprising an elongate housing having a passageway for the movement of air therethrough, one end of said housing being an output end adapted for insertion into the mouth or nasal passages of a user thereof; said passageway terminating in an emptying chamber adjacent the output end of said housing, the cross-sectional area of said passageway being less than the cross-sectional area of said emptying chamber; means for receiving a medicament-holding container; and hollow means for directing a stream of air drawn therethrough during inhalation into an open medicament-holding container positioned within said container receiving means, whereby air drawn through said passageway and through said hollow means cooperate to cause the medicament in the medicament-holding container to be dispensed therefrom.

3,938,517

TEAT CAUTERY BULLET

Carsten D. Anderson, 1307 N. Summer Range Road, DePere, Wis. 54115

Filed Mar. 14, 1975, Ser. No. 558,314
Int. Cl.² A61M *35/00, 31/00*
U.S. Cl. 128—271 **26 Claims**



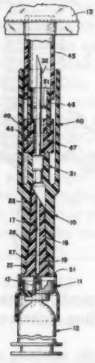
1. A teat cautery bullet shaped device for insertion through a teat orifice and into the p illary duct of an injured teat of a dairy cow or similar animal to control hemorrhaging and prevent formation of blood clots in the papillary duct, said device being formed of solid material having astringent and styptic qualities which is soluble by liquid in said teat to control such hemorrhaging and clotting, said device comprising a nose portion shaped to facilitate insertion, an integral neck portion shaped to facilitate retention by the teat sphincter muscles surrounding said papillary duct, and an integral base portion shaped to facilitate manual insertion and removal and to prevent passage or loss of the device upward into the teat sinus.

3,938,518

SYRINGE ATTACHMENT DEVICE

Edward A. Tischlinger, Niantic, Conn., assignor to Astra Pharmaceutical Products Inc., Worcester, Mass.

Filed Jan. 15, 1975, Ser. No. 541,205
Int. Cl.² A61J *1/00*
U.S. Cl. 128—272 **4 Claims**



1. An attachment unit for medicinal syringes equipped with a transfer spike comprising first and second elongated tubular portions connected together at their inner ends and extending from such connection in axially aligned, opposed directions so that said first tubular portion provides at one end of the unit an entry passage for a syringe spike and said second tubular portion provides at the other end of the unit an entry passage for a tubular entry port of the plastic bag for medicinal material, the bore of said first tubular portion being formed at its

outer end portion to provide a first seat snugly receiving one part of a syringe spike and adjacently to said outer end portion being formed to provide a second seat for another part of the spike, an internal shoulder formed in such bore between said first and second seats to properly register said spike parts on said seats, the bore of said first tubular portion having a length greater than the length of the spike insertable thereinto, tubular means providing a reduced passageway axially aligned with the bores of said first and second tubular portions and communicating at one end with the inner end of the bore in said first tubular portion, a needle cannula having one end located in said reduced passageway with its bore in communication with said first tubular portion bore, means for mounting said one end of the needle cannula in liquid-tight relation in said reduced passageway and with the remainder of said needle extending outwardly therefrom axially through the bore of said second tubular portion, the bore of said second tubular portion being formed to receive the tubular entry port of a plastic medicinal bag with such remainder of the needle extending through the bore of such port, and the outer end of said tubular means providing a stop seat for the terminal outer end of such entry port.

3,938,519

MEDICAL LIQUID CONTAINER WITH A TOGGLE FILM LEAK TESTER AND METHOD OF LEAK TESTING WITH SAME

Charles J. McPhee, Sylmar, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 26, 1974, Ser. No. 445,849
Int. Cl.[2] A61J 1/00
U.S. Cl. 128—273 **13 Claims**

1. A medical liquid container with a puncturable tubular connector for joining the container to a fluid transferring device, wherein the improvement comprises:

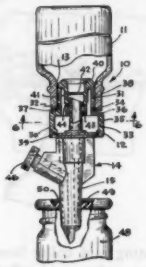
a combined connector and toggle leak tester that includes an upstanding thermoplastic tube with a passage and an outer end surface; a first thermoplastic barrier integrally formed with the tube and sealing off the tube's passage at a location spaced inwardly from the tube's outer end surface; a flexible film bonded at a manually peelable joint to the tube's outer end surface and forming a second barrier, said film being in a deformed state with one convex surface and one concave surface for toggling when a pressure differential is applied across the film, whereby the film can function as a leak tester and also be isolated from contact with the container's contents.

3,938,520

TRANSFER UNIT HAVING A DUAL CHANNEL TRANSFER MEMBER

Henry Scislowicz, Lake Bluff, Ill., and Thomas A. Frazier, Williamsport, Pa., assignors to Abbott Laboratories, North Chicago, Ill.

Filed June 10, 1974, Ser. No. 477,876
Int. Cl.[2] A61J 01/08
U.S. Cl. 128—272.3 **16 Claims**



1. A transfer unit for transferring a material from a first container to a second container, said transfer unit comprising:

a container having an opening for storing the material to be transferred, a closure sealing the opening in the container and a transfer member constructed and arranged for opening of the closure to permit transfer of the material from the first container to the second container;

said closure including a diaphragm section sealing the opening in the container with means affixing the closure to the container;

and means operatively associated with said closure or said container and said transfer member affording retentive movement of said transfer member toward said sealing diaphragm section of said closure and ready release of said transfer member from said closure;

said transfer member comprising an elongated body portion having two channels therein, one channel extending longitudinally the length of the body to provide a passageway for the transfer of the material between said containers, the other channel extending along said body and terminating outside of said closure to provide a passageway for the entry of air therethrough, the body of the transfer member including a piercing end on the end of the body projecting from the closure and a cutting element extending from the end opposite the piercing end of said body and receivable within the closure to open the closure and permit transfer of material between said containers, said cutting element disposed adjacent the end of said one channel and adapted to receive the tip of a syringe.

3,938,521

COLLECTING BAG

Michael C. Ritota, Newark, and L. Phillip Mancini, Bricktown, both of N.J., assignors to M.E.D.S. Corporation, Newark, N.J.

Continuation-in-part of Ser. No. 265,343, June 22, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 508,158
Int. Cl.[2] A61F 5/44
U.S. Cl. 128—283 **18 Claims**

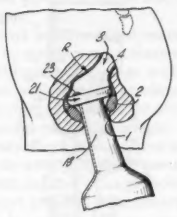
1. A collecting bag for use in the collection of excretions from body openings, comprising

a. an inflatable collar for insertion into said body opening, said inflatable collar including an inner surface and an outer surface, thereby forming a closed annular space between said inner and outer surfaces,

b. a continuous elongated tubular member having a first end and a second end, said first end being sealingly attached

to said inner surface of said inflatable collar, so that the inner surface of said inflatable collar is attached to a portion of the continuous surface of said elongated tubular member,

c. bag means associated with the second end of said elongated tubular member remote from said inflatable collar, so that said bag means is disposed exterior to said body opening upon insertion of said inflatable collar into said body opening,



d. means for inflating said collar from a point external to said body opening when said inflatable collar has been inserted into said body opening, and

e. channel means for connecting said means for inflating said inflatable collar, the channel means being located along the interior of said bag means and said elongated tubular member so that said channel means does not contact said body opening upon insertion of said inflatable collar into said body opening.

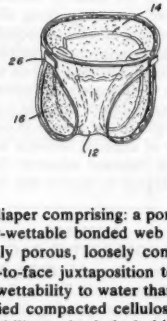
3,938,522
DISPOSABLE DIAPER

Virginia L. Repke, Oak Forest, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 266,013, June 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 187,239, Oct. 7, 1971, abandoned. This application Sept. 11, 1973, Ser. No. 396,242

Int. Cl.² A61F *13/16*

U.S. Cl. 128—287 **39 Claims**



1. A multi-layer diaper comprising: a porous facing layer in the form of a water-wettable bonded web of mixed long and short fibers; a highly porous, loosely compacted, cellulosic fibrous batt in face-to-face juxtaposition to said facing layer and having greater wettability to water than said facing layer; a paper-like, densified compacted cellulosic fibrous layer of relatively high wettability and relatively high fluid retentivity integral with said loosely compacted batt on the face thereof opposite the face in juxtaposition to said facing layer, said densified layer extending continuously over a given area of said batt and being of greater thickness dimension in selected regions, said regions of greater thickness dimension cooperating with the adjacent unthickened portions of said continuous densified layer to increase the fluid handling capacity of the densified layer and to direct the flow of fluid to selected areas of the densified layer, said regions of greater thickness dimension being integral with said densified layer and projecting into said loosely compacted batt to reinforce the same; and a water-impervious backing sheet adhered to said densified layer.

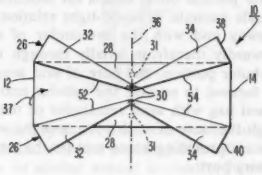
3,938,523
PREFOLDED AND PACKAGED DISPOSABLE DIAPER

Barbara Faye Gilliland, Blackwood, N.J., and Christine Arentzen Henisee, West Chester, Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Oct. 17, 1974, Ser. No. 515,699

Int. Cl.² A61F *13/14*; A41B *13/02*

U.S. Cl. 128—287 **5 Claims**



1. A prefolded and packaged disposable diaper which, in an unfolded condition, has a substantially rectangular configuration including a longitudinal dimension defined between end margins and a shorter transverse dimension defined between side margins, said prefolded and packaged diaper including:

A. a double-pleat fold on each side of the diaper; each double-pleat fold including an inner panel overlying a central section of the diaper and an outer panel overlying said inner panel, each outer panel including two wing sections extending outwardly beyond its underlying inner panel, one of said wing sections being disposed on each side of a transversely extending medial line of the diaper; the wing sections of both outer panels which are disposed on the same side of the transversely extending medial line diverging from each other in a direction from the transversely extending medial line to an end margin of said diaper; and

B. said disposable diaper being folded upon itself along the transversely extending medial line to dispose the wing sections of each outer panel in engagement with each other.

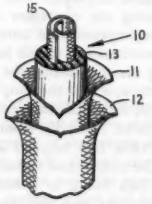
3,938,524
COMPLIANT MANDREL AND MANDREL ASSEMBLY FOR GROWING GRAFT TUBES

Charles Howard Sparks, deceased, late of Portland, Oreg., and by Margaret J. Sparks, executrix, 3725 SE. Martins St., Portland, Oreg. 97202

Continuation-in-part of Ser. No. 368,811, June 11, 1973, Pat. No. 3,866,609, which is a continuation of Ser. No. 241,189, April 5, 1972, abandoned, Division of Ser. No. 101,031, Dec. 23, 1970, Pat. No. 3,710,777. This application Sept. 16, 1974, Ser. No. 506,214

Int. Cl.² A61B *17/00*; A61F *1/24*

U.S. Cl. 128—303 R **11 Claims**



1. A mandrel assembly for growing a graft tube with living tissue, comprising an elongated compliant mass of material

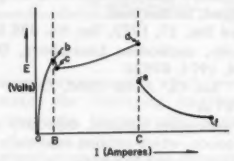
which may not have sufficient tensile strength for withdrawing the mandrel from said mandrel assembly after said graft tube has been grown, and a compliant tension element extending throughout the length of the mandrel and forming an integral part thereof for pulling the mandrel out of said mandrel assembly after said graft tube has been grown, an outer fabric tube on said mandrel, and an inner layer of porous material holding said fabric tube spaced away from said mandrel.

3,938,525

PLASMA SURGERY

Robert G. Coucher, Salt Lake City, Utah, assignor to Hogle-Kearns International, Salt Lake City, Utah

Filed May 15, 1972, Ser. No. 253,494
Int. Cl.² A61N *1/44*
U.S. Cl. 128—303.1 **6 Claims**



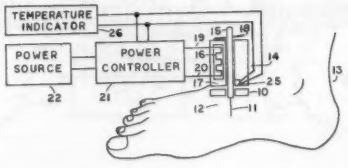
1. A method for cauterizing tissue adjacent a surgical incision, which comprises:
establishing and maintaining an electrically neutral, D.C.-induced cold plasma of sufficiently small cross section to permit a narrow region of contact between the plasma and tissue; and
applying the plasma to tissue adjacent a surgical incision to cauterize the same.

3,938,526

ELECTRICAL ACUPUNCTURE NEEDLE HEATER

Weston A. Anderson, 763 La Para Ave., Palo Alto, Calif. 94306, and Bruce E. Waller, 533 Pali Drive, Long Beach, Calif. 90805

Filed May 20, 1974, Ser. No. 471,649
Int. Cl.² A61H *39/06*
U.S. Cl. 128—303.1 **21 Claims**



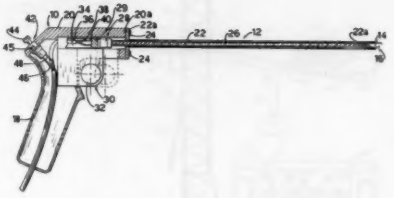
1. The method of heating an inserted acupuncture needle comprising the steps of:
thermally coupling said acupuncture needle to an electrical heating means,
detachably coupling said electrical heating means to said acupuncture needle for support and positioning, of said electrical heating means by said needle,
supplying electrical power to said electrical heating means thereby to generate heat,
controlling said electrical power supplied to said electrical heating means to control the amount of heat generated.

3,938,527

INSTRUMENT FOR LAPAROSCOPIC TUBAL CAUTERIZATION

Jacques E. Rioux, Quebec; Gerald Turp, Dollard des Ormeaux, and Francois Jacques, Mascouche, all of Canada, assignors to Centre de Recherche Industrielle de Quebec, Quebec, Canada

Filed July 13, 1973, Ser. No. 378,935
Claims priority, application Canada, July 4, 1973, 175625
Int. Cl.² A61B *17/36*
U.S. Cl. 128—303.17 **9 Claims**



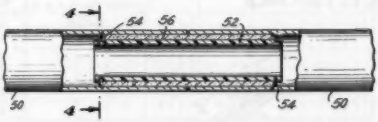
1. Instrument for laparoscopic tubal cauterization by intra-abdominal cavity penetration comprising: a grip member; an elongated narrow probe element having one end removably attached to said grip member whereby said probe element may be disposed of after use; said probe element including a sleeve member; said sleeve member being shaped to be easily insertable through a small cut in the abdominal wall of said cavity and to reach a fallopian tube therein; a pair of electrically conductive bi-polar elements carried by said probe element within said sleeve member in such spaced relationship to one another as to avoid electrical short therebetween and longitudinally displaceable within said sleeve member; said elements having cooperating extremities defining tube-grasping portions; said extremities cooperating with the open end of said sleeve member for causing a strong squeezing action by said extremities externally on said tube being grasped; means on said grip member connecting each said member connecting each said bi-polar elements to an external power source and allowing a current discharge between the tube-grasping portions externally on the squeezed tube for complete coagulation of said tube.

3,938,528

IMPLANTING AND SPLICING ARTICLES AND METHODS FOR LIVING BEINGS

Louis Bucalo, Holbrook, N.Y., assignor to Investors in Ventures, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 359,429, May 11, 1973, Pat. No. 3,815,578. This application Aug. 23, 1973, Ser. No. 390,926
Int. Cl.² A61B *17/11*
U.S. Cl. 128—334 C **14 Claims**



1. In an implanting method, the steps of introducing an implant into a body cavity which is lined with mucosa while simultaneously removing mucosa from at least part of the cavity and placing in engagement with an inner surface of the cavity from which the mucosa has been removed a means carried by the implant for promoting the ingrowth of tissue.

3,938,529
INDWELLING URETERAL CATHETER

Robert P. Gibbons, 7310 Mercer Terrace Drive, Mercer Island, Wash. 98040

Filed July 22, 1974, Ser. No. 490,573
Int. Cl.² A61M 25/00
U.S. Cl. 128—349 R 6 Claims

1. An indwelling ureteral catheter comprising a medical-grade, flexible tube of sufficient strength to minimize collapse of the walls of the tube, a plurality of apertures adjacent opposite ends of the tube, and a plurality of circumferentially and longitudinally spaced, flexible, directional anchoring means provided generally adjacent the longitudinal center of the tube for allowing movement of the tube in one direction but resisting movement of the tube in the opposite direction, said anchoring means including soft, flexible, resilient, laterally and axial outwardly directed tips of a length sufficient to span the distance between the tube and the sidewall of the ureter and flexed radially outwardly with sufficient force to wedge against the sidewall of the ureter and hold the tube against axial outward movement caused by gravity or peristaltic activity, said tips having sufficient flexibility and softness to flatten outwardly against the tube during intentional outward movement of the tube during withdrawal so as not to penetrate the sidewall of the ureter, whereby the tube can be inserted into the ureter in one direction, remain lodged against outward movement caused by peristaltic activity, but be safely removed when required.

3,938,530
CATHETER

Louis S. Santomieri, 4517 San Marino Drive, Davis, Calif. 95616

Filed Nov. 15, 1974, Ser. No. 524,241
Int. Cl.² A61M 25/00
U.S. Cl. 128—349 R 4 Claims

2. In a soft, flexible, retention-type catheter which includes a primary tube having an outer-end tip, an initially contracted but expandable retainer formed in the primary tube adjacent the tip and adapted to be expanded and contracted by rearward and forward movement, respectively, of said tip, a relatively small diameter secondary tube disposed within the primary tube in longitudinally movable relation, the forward end of the secondary tube being secured to the tip and open thereat, and the rear end of the secondary tube exteriorly of the primary tube being adapted for manipulation to impart such rearward and forward movement to the tip through the medium of said secondary tube serving as a pull-push element; the improvement characterized by an internal tip formed in the primary tube adjacent but short of the outer-end tip, the internal tip having a central opening therein through which the secondary tube extends in slidable, guided relation.

3,938,531
SMOKING MATERIAL AND THE PROCESS OF MAKING THE SAME

Hans von Castelmur, Basel, Switzerland, assignor to Tamag Basel AG., Basel, Switzerland

Filed Dec. 17, 1973, Ser. No. 425,115
Claims priority, application Luxemburg, Dec. 28, 1972, 66773; Feb. 14, 1973, 67028
Int. Cl.² A24B 13/00, 15/08
U.S. Cl. 131—17 A 5 Claims

1. A smoke-generating material, especially as synthetic or regenerated tobacco, which consists essentially of: 40 to 60% by weight of comminuted botanicals in the form of cereal-grain, nut, and tobbaco scraps and waste;

12 to 28% by weight of inorganic and organic fillers and compounds selected from the group which consists of magnesium formate, tartaric acid, potassium nitrate, ammonium phosphate and calcium carbonate;

6 to 16% by weight of cellulosic substances and pectin binders;

7 to 21% by weight of ethylene glycol and glycerol as plasticizers;

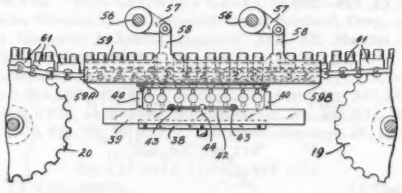
5 to 15% by weight of flavorings; and

0.03 to 1% by weight of a vanillin compound of urea selected from the group consisting of vanillylidene-urea $C_9H_{10}N_2O_3$ and divanillylidene-urea $C_{17}H_{16}N_2O_3$.

3,938,532
CONTAINER CLEANING APPARATUS

Momir Babunovic, Des Peres, Mo., assignor to Barry-Wehmiller Company, St. Louis, Mo.

Filed Feb. 10, 1975, Ser. No. 548,538
Int. Cl.² B08B 3/02
U.S. Cl. 134—43 10 Claims



1. Container cleaning apparatus comprising a plurality of pocketed carriers for the containers to be cleaned, conveying means to move said carriers continuously through the apparatus, means defining a linear path of movement for said conveying means, fluid jet spray means adjacent said linear path, movable means operably supporting said spray means for forward and reverse movement in a generally horizontal path, drive means operably connected to said movable means to effect the forward and reverse movement of said spray means, and an operating connection between said drive means and said linear path defining means for periodically raising and lowering said carriers, said drive means and operating connection coordinating said forward movement of said spray means

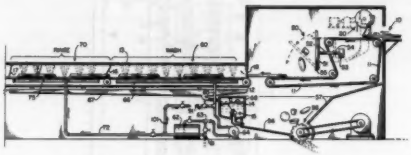
with lowering of said carriers and reverse movement of said spray means with raising of said carriers.

3,938,533

AUTOMATIC SCULLERY SYSTEM

Wilton Richard, Rte. 1, Box 359-1/2, Shreveport, La. 71105

Filed Oct. 29, 1973, Ser. No. 410,482
Int. Cl.² B08B 3/02, 3/10
U.S. Cl. 134—63 15 Claims



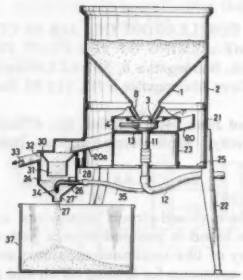
1. Automatic scullery apparatus which comprises:
conveyor means for conveying carrying trays having thereon, inter alia, magnetically responsive culinary items;
means for selectively magnetically removing magnetically responsive culinary items from trays on said conveyor means while leaving nonmagnetically responsive residual contents on said trays; and
means for collecting and cleansing the removed culinary items.

3,938,534

APPARATUS FOR WASHING CEREALS

Nobuo Akizawa, Horinouchi 3-44-7, Suginami, Tokyo, Japan

Filed Aug. 1, 1974, Ser. No. 493,700
Int. Cl.² B08B 3/02
U.S. Cl. 134—104 7 Claims



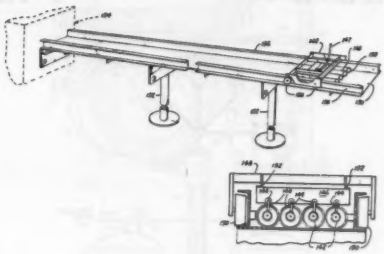
1. An apparatus for washing cereals comprising in combination, a hopper of reduced size at the lower part thereof, and having an opening at its bottom, a cereal washing tank positioned under the opening and larger than the opening, the said opening being no lower than that of a cover on the tank, which cover has an opening therein, a hollow water supply tube projecting into the cereal washing tank, and a hollow rotor on said tube and connecting to said tube, the rotor having an upper vertically extending flange plate with a notch at the upper edge thereof and having a jet hole in the rotor for water discharge to rotate the rotor, and the top of the rotor extending into the opening in the lower part of the hopper to reduce the discharge area thereof.

3,938,535

TUBE CLEANING DEVICE

Robert R. Cradeur, Sulphur, and John E. Cardone, Lake Charles, both of La., assignors to Browning-Ferris Industries, Inc., Houston, Tex.

Division of Ser. No. 278,565, Aug. 7, 1972. This application June 10, 1974, Ser. No. 477,848
Int. Cl.² B08B 3/02, 9/02
U.S. Cl. 134—167 C 4 Claims



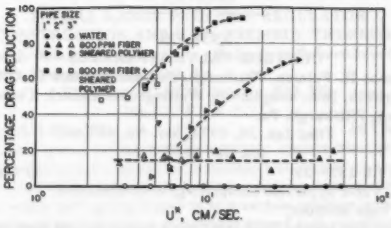
1. A tube cleaning device, comprising:
at least one water jet lance,
means for extending and retracting said lance,
support means for said lance including an elongated slotted hollow member in which said lance is slidably positioned therein to prevent bending collapse of said lance when subjected to end loading, and
means for supplying water under pressure to said lance, said water supply means including a manifold block having means therewith for distributing said pressurized water to said lance and a duct mounted with said manifold block and said lance for conducting said pressurized water therebetween, wherein said elongated slotted hollow member having a slot formed therein slidably receives said duct adjacent thereto said slot.

3,938,536

PROCESS FOR REDUCING THE TURBULENT DRAG IN CONDUITS AND AROUND SUBMERGED OBJECTS

Arthur B. Metzner, Wilmington, Del.; Raymond C. Vaseleski, Charleston, W. Va., and Wei-Kuo Lee, Millburn, N.J., assignors to The University of Delaware, Newark, Del.

Filed Oct. 11, 1974, Ser. No. 514,115
Int. Cl.² F17D 1/16
U.S. Cl. 137—13 5 Claims



1. A process for reducing the turbulent drag of a fluid in a conduit or around a submerged object which comprises adding to the fluid a soluble polymer and a dispersable non-soluble fibrous substance having an aspect ratio of at least 100.

3,938,537
METHOD OF PREPARING LIQUID MIXTURES OF PREDETERMINED COMPOSITION

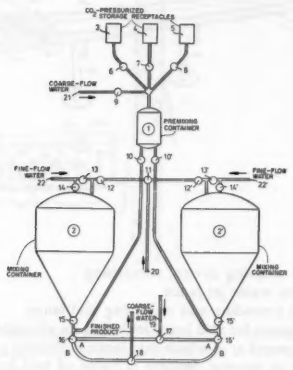
Jürgen Kalko, and Wolfgang Crull, both of Heilbronn a. N., Germany, assignors to Lucca GmbH, Heilbronn a. N., Germany

Continuation of Ser. No. 353,723, April 23, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,915

Claims priority, application Germany, Apr. 25, 1972, 2220224

Int. Cl.² B01F *15/04*

U.S. Cl. 137—14 **1 Claim**



1. A method of preparing a beverage consisting predominantly of water and including a plurality of other components, said method comprising the steps of:

a. metering quantities of each of said other components by weight into respective storage receptacles and pressuring each of said storage receptacles with CO_2;

b. evacuating a premixing container and a mixing container simultaneously to a pressure of at most 0.5 atm. abs.;

c. successively communicating at least two of said storage receptacles with said premixing container to induce the respective components to pass by suction from said storage receptacles into said premixing container;

d. connecting said premixing container to said mixing container to induce by suction the contents of said premixing container to empty into said mixing container;

e. thereafter drawing water by the suction in said mixing container into the latter and at least in part through said premixing container for mixture with said components in said mixing container; and

f. discharging the mixture of said components with water from said mixing container.

3,938,538
CONTROL VALVE APPARATUS

Thomas H. Putman, Pittsburgh, Pa., and William O. Osbon, Griffith, Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1974, Ser. No. 437,448

Int. Cl.² B60T *8/14*

U.S. Cl. 137—39 **10 Claims**

1. Valve apparatus comprising, in combination:

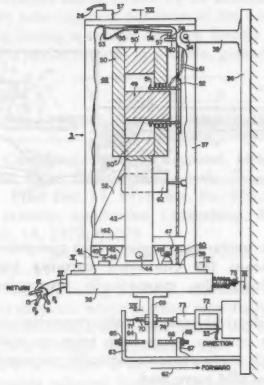
a base member;

first and second fluid input ports seated in said base member;

first and second fluid output ports seated in said base member;

first and second valves seated in opposite ends of said base member, with said first valve connected to said first fluid input port and said first fluid output port, and with said second valve connected to said second fluid input port and said second fluid output port;

a pendulum rotatably attached at one end thereof to said base member, and including an arm attached thereto at an angle with respect to the longitudinal axis of said pendulum, including first and second valve occluding means attached to the respective ends of said arm and



aligned with said first and second valves respectively for being seated in or unseated from said first and second valves respectively as said pendulum rotates in one direction and the opposite direction respectively;

a magnet attached to the other end of said pendulum; and

a coil situated adjacent said magnet which when energized produces a magnetic field which either attracts or repels said magnet such that said pendulum rotates in either said one or said opposite direction.

3,938,539
APPARATUS FOR LEADING OFF AIR IN CONNECTION WITH THE MEASURING OF THE FLOW OF A LIQUID

Lennart Strouth, Bondegatan 5, 582 62 Linkoping, and Claes Björkman, Grev Magnigatan 9 III, 114 55 Stockholm, both of Sweden

Filed June 14, 1974, Ser. No. 479,691

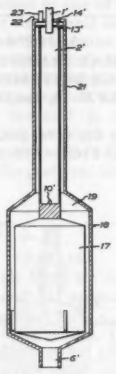
Claims priority, application Sweden, June 15, 1973, 73084238

Int. Cl.² A61M *5/14*

U.S. Cl. 137—202 **6 Claims**

1. For use in a closed-circuit pressurized conduit system through which blood is pumped from a patient through an artificial kidney or like treatment apparatus and returned to the patient, an apparatus for leading off air and preventing the build-up of air pressure in the system and for measuring the flow of blood through the system, said apparatus comprising an inlet chamber and an outlet chamber, inlet means adapted to be connected in the conduit system for directing the blood being pumped therethrough into said inlet chamber and outlet means adapted to be connected in the conduit system for directing blood from said outlet chamber into the conduit system, orifice means in the bottom portion of said inlet chamber providing a flow path from said inlet chamber into said outlet chamber, normally open vent means for venting said outlet chamber to atmosphere, said vent means including valve means operable between an open and a closed position, valve actuating means responsive to the level of blood in one of said chambers for moving said valve means to the closed position to permit build up of system pressure in said outlet chamber and to move said valve to the open position to vent

said second chamber to atmosphere upon the blood level in said one chamber dropping below a predetermined level, and



blood level measuring means carried by said inlet chamber indicating the level of blood above said orifice means and thereby providing a visible flow rate indication.

3,938,540

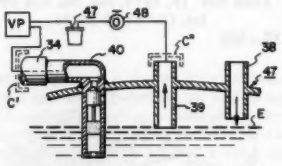
VACUUM-OPERATED FLUID BOTTLE FOR TANDEM SYSTEMS

Legrand K. Holbrook, and David S. Ostler, both of Salt Lake City, Utah, assignors to Medical Development Corporation, Salt Lake City, Utah

Continuation of Ser. No. 187,275, Oct. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 876,438, Nov. 13, 1969, Pat. No. 3,620,408. This application Oct. 2, 1973, Ser. No. 402,788

Int. Cl.² A61M *1/00*

U.S. Cl. 137—205 **3 Claims**



1. A vacuum-fillable, liquidcollection bottle having an upper region and a fluid inlet port, and overflow port, a vacuum port at said upper region, said vacuum port being provided with fluid-level operated valve means for automatically shutting off air communication solely through said vacuum port when liquid within said bottle reaches a predetermined level, said overflow port having a depending, liquid-receiving extremity disposed at said predetermined level, said fluid inlet port being disposed above said predetermined level and above said overflow port extremity, and a vacuum pump connected to said vacuum port and selectively coupled to said overflow port, said overflow port being constructed for selective closure and, therefore, selective uncoupling from said vacuum pump.

3,938,541

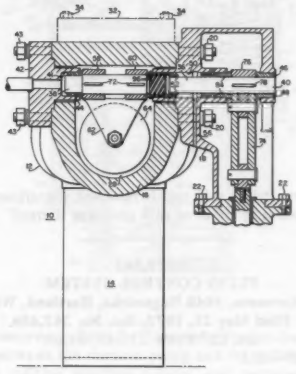
SHAFT SEAL FOR A CHECK VALVE

James R. Polacheck, Wayne, and Gilbert F. Hyde, Swarthmore, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 25, 1974, Ser. No. 436,590

Int. Cl.² F16K *41/16*

U.S. Cl. 137—239 **9 Claims**



1. A check valve comprising:

a valve casing,

a valve shaft rotatably disposed within said valve casing,

said casing having a first axial portion having a first predetermined tolerance fit with said shaft, said casing having a second axial portion having a second predetermined tolerance fit with said shaft, said second axial portion being contiguous with said first axial portion, said second tolerance fit being of a dimension greater than said first tolerance fit, and,

sealing means for providing a seal between said casing and said rotatable shaft, said sealing means being disposed adjacent said second axial portion of said casing,

said casing having a valve chamber defined therein and said shaft having a groove disposed on the surface thereof, said groove having a sharp edge thereon, said groove having a first end and a second end, said first end of said groove communicating with said valve chamber, and said second end of said groove being disposed on said shaft at a point other than those points on said shaft lying within said first axial portion of said valve casing.

3,938,542

PLURAL RANGE PRESSURE REGULATOR CONSTRUCTION AND CAP ASSEMBLY THEREFOR

John J. Bolha, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

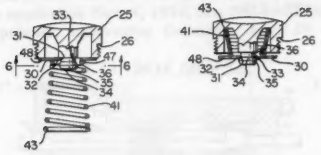
Filed Nov. 8, 1974, Ser. No. 522,320

Int. Cl.² F16K *31/12*

U.S. Cl. 137—271 **16 Claims**

1. In a plural range pressure regulator construction having a spring means for acting on a flexible wall of said construction to provide one pressure range for said regulator construction when said spring means is in a certain position whereof and for being stored in a removable cap of said construction so that said spring means will be in another position thereof and will not act on said wall so as to permit said regulator construction to provide another pressure range thereof, the improvement comprising securing means for securing said spring means to said cap when said spring means is in either

of said positions thereof whereby said spring means is adapted to be removed from the housing of said construction in unison



with said cap when said cap is removed therefrom and said spring means is in either of said positions thereof.

3,938,543

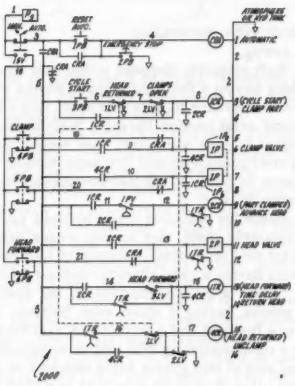
FLUID CONTROL SYSTEM

Gerald T. Sorenson, 3440 Nagawicka, Hartland, Wis. 53029

Filed May 21, 1973, Ser. No. 362,456

Int. Cl.[2] F16K *31/143, 51/00*

U.S. Cl. 137—312 **11 Claims**



1. A fluid control system, comprising:

a source of fluid under pressure,

first and second pilot operated relay valves each having a pilot port for receiving fluid under pressure from said source to operate the relay valve,

first valve means in its blocked state connected between said source and said pilot port of said first relay valve,

said first valve means including vent means effective to vent fluid under pressure from said source which would otherwise leak through said valve to said pilot port while said first valve means is in its blocked state,

actuating means for changing the state of said first valve means to a passing state,

second valve means in its blocked state connected between exhaust means and said pilot port of said first relay valve,

actuating means for changing the state of said second valve means to a passing state,

said first relay valve having at least one pair of inlet and outlet control ports normally in the blocked state, with the inlet port connected to the source of fluid and the outlet port operably connectable to the pilot port of the second pilot operated relay valve, and

said first relay valve including vent means effective to vent fluid under pressure from said source which would otherwise leak through said valve to said outlet port while said control ports are in the normally blocked state.

3,938,544

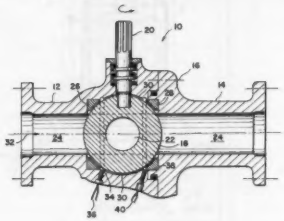
VALVE WITH HEAT TRANSPORT MONITOR FOR LEAKAGE DETERMINING RATE

Henry J. Bernaerts, R.F.D. 10, Box 1610, Laurel Lane, Annapolis, Md. 21401

Filed May 28, 1974, Ser. No. 473,853

Int. Cl.[2] F16K *49/00;* **G01F** *1/68*

U.S. Cl. 137—334 **5 Claims**



1. A valve comprising:

a body;

a closure element within said body;

sealing members between said valve body and said closure element; and

means within said valve body for determining the leakage of the fluid of the main fluid flow controlled by said valve, between said closure element and said sealing members.

3,938,545

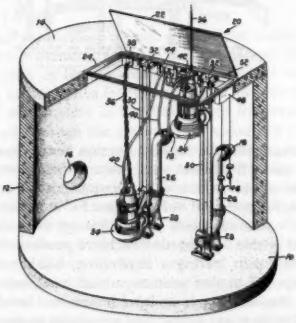
ACCESS COVER WITH MOVEABLE ATTACHING DEVICES FOR UNDERGROUND PUMPING STATIONS AND OTHER INSTALLATIONS

Nicholas Nagy, Westport, and Clinton F. Egerton, Stamford, both of Conn., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 15, 1974, Ser. No. 524,098

Int. Cl.[2] E02D *29/14*

U.S. Cl. 137—363 **16 Claims**



1. An underground pumping station, comprising:

a sump basin including a liquid inlet, a liquid outlet and a top having an access opening;

a pump disposed in said basin and having a discharge outlet connected to the liquid outlet of the basin;

a cover frame fixedly mounted in the top of the basin and extending about the periphery of the access opening;

a support member attached to said cover frame and extending about the periphery of the access opening;

a cover hingedly attached to one of said cover frame and support member for closing said access opening;

attaching members slidably mounted to said support member whereby the attaching members may be positioned to any desired location on the support member; and

fastening means for engaging said attaching members and accessories to be mounted in the pumping station whereby said attaching members are fixed at a desired location on the support member and the accessories are attached thereto in the preferred location for a particular pumping station.

3,938,546

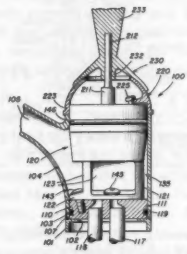
FAUCET WITH VALVE CARTRIDGE

Gerald J. Farrell, Elmhurst, Ill., assignor to Elkay Manufacturing Company, Broadview, Ill.

Division of Ser. No. 313,824, Dec. 11, 1972, Pat. No. 3,854,493. This application Oct. 15, 1974, Ser. No. 514,607

Int. Cl.² F16K *51/00*

U.S. Cl. 137—454.2 **5 Claims**



1. A faucet comprising a faucet base, a hollow casing mounted on said faucet base, a cover for said casing, a spout carried by said casing and having a passageway therethrough communicating with the interior of said casing, and said faucet base having at least one fluid inlet, and a valve cartridge in said casing and including a generally cylindrical housing having a chamber therein, inlet and outlet ports in said housing for said chamber, valve means in said chamber for controlling the quantity of fluid delivered from said inlet port to said outlet port, control means extending from one end of said housing for controlling said valve means, said housing having a valve base portion at the other end thereof, the maximum outer diameter of said valve base portion being no greater than the maximum outer diameter of any other portion of said housing, said valve base portion having a plurality of recesses extending laterally thereinto and defining flange means at the adjacent end of said housing, said flange means having at least one opening extending therethrough, means passing through said opening from said recess for attaching said flange means to said faucet base, said inlet port being in registration with the fluid inlet of said faucet and said outlet port being in communication with the interior of said casing.

3,938,547

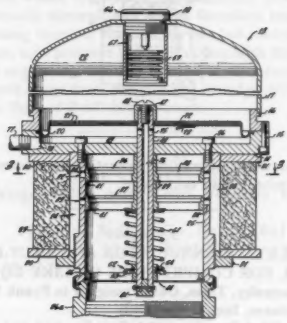
PRESSURE REGULATOR

Leon Jones, 15081 Moran St., Westminster, Calif. 92683

Division of Ser. No. 336,186, Feb. 27, 1973, Pat. No. 3,811,467. This application Apr. 15, 1974, Ser. No. 460,954

Int. Cl.² F16K *15/00, 31/12*

U.S. Cl. 137—488 **21 Claims**



1. A pressure regulator for Tee connection to the line which extends between the vacuum pump and the milking machine of a cow milking machine system, said pressure regulator comprising:

a. air valve means to admit atmospheric air into said line,

b. a diaphragm connected to said air valve means,

c. spring means connected to said air valve means and biasing the same toward closed condition,

d. means to define a dome chamber on one side of said diaphragm,

said one side of said diaphragm being such that an increase in the air pressure in said dome chamber relative to the air pressure on the other side of said diaphragm causes said disphragm to oppose said spring means and to open said air valve means, and a decrease in the air pressure in said dome chamber relative to the air pressure on said other side of said diaphragm causes said diaphragm to aid said spring means in closing said air valve means,

e. means to admit atmospheric air into said dome chamber and to maintain the air pressure in said dome chamber at a predetermined constant value substantially below atmospheric pressure,

f. means to bleed air from said dome chamber to said line, and

g. means to subject said other side of said diaphragm to the air pressure of said line,

whereby said air valve means is caused to admit into said line sufficient atmospheric air that the pressure in said line remains substantially constant.

3,938,548

FLUID FLOW CONTROL VALVES

Bernard Francis Hope, Birmingham, England, assignor to Coplastix Limited, England

Filed Apr. 16, 1974, Ser. No. 461,310

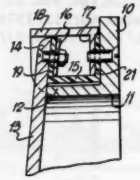
Claims priority, application United Kingdom, May 2, 1973, 20942/73

Int. Cl.² F16K *15/03*

U.S. Cl. 137—527.8 **12 Claims**

1. A tidal flap valve comprising a frame defining a flow opening and adapted to be fixedly mounted over a registering opening in a substantially vertical wall, a closure member for said flow opening, a flexible hinge interconnecting an upper part of said closure member to said frame at an upper part of said flow opening, and a casing member projecting from said frame at said hinge, said frame and casing members and the upper portion of said closure member being cooperatively

formed for defining a substantially enclosed space wherein said hinge is disposed for protection against damage and undesired access while permitting operational movement of said closure member about said hinge.

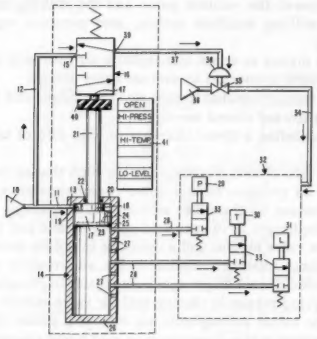


3,938,549

TATTLETALE ANNUCIATOR AND SHUT-DOWN CONTROL FOR COMPRESSORS OR LIKE EQUIPMENT

J. David Nunneley, Tulsa, Okla., assignor to Frank W. Murphy Manufacturer, Inc., Tulsa, Okla.

Filed Dec. 16, 1974, Ser. No. 533,214
Int. Cl.² G08B *1/04*
U.S. Cl. 137—557 **10 Claims**



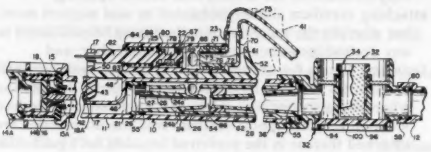
1. An annunciator and shut-down control for machines equipped with malfunction sensors of the fluid venting type, comprising a cylinder body having a working fluid inlet near one end thereof and plural side wall malfunction sensing ports communicating with the chamber of the cylinder body and adapted for connection with automatic venting means of said malfunction sensors, a piston within the bore of the cylinder body having differential areas on the opposite sides thereof in said bore, said piston having an orifice communicating with said differential areas whereby fluid pressure on opposite sides of the piston in said bore may be equalized, a piston rod secured to the piston and extending beyond one end of the cylinder body and having a position indicator secured thereto for movement therewith, a malfunction indicia means positioned near said rod and indicator and cooperating with the indicator when the piston is stopped in said bore at a particular malfunction indicating position to indicate directly the nature of the malfunction and where located relative to the cylinder body and said sensing ports, a machine start-up and shut-down control valve including an actuator button located in the path of movement of said piston rod and adapted to be engaged by the latter, said control valve having in and out ports for connection respectively with a working fluid supply and a conduit leading to a supply valve for a machine being monitored, said working fluid inlet of the cylinder body adapted for connection with said working fluid supply.

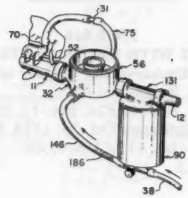
3,938,550

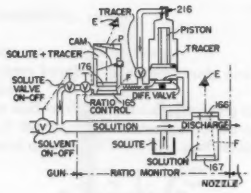
CONTINUOUS FLOW RATIO MONITOR

Valentine Hechler, IV, 26 Meadow View Road, Northfield, Ill. 60093

Filed June 24, 1974, Ser. No. 482,353
Int. Cl.² G01N *1/20, 21/02*
U.S. Cl. 137—559 **23 Claims**







1. A solution dispensing system comprising:
means for supplying solvent under a pressure differential in a confined flowing stream;
means for supplying solute under a pressure differential in a confined flowing stream having an energy transmissivity different from that of the solvent;
means for continuously mixing said streams in a proportioned ratio to dispense a stream of flowing solution; and
means for monitoring said proportioned ratio including chambers having different depths disposed in close proximity for comparing the energy radiation transmissivity of said flowing streams of solute and solution at relative radiation transmitting depths related to a desired percentage of solute in the solution.

3,938,551

ANESTHESIA REBREATHING APPARATUS

Melvyn L. Henkin, 19640 Greenbriar Drive, Tarzana, Calif. 91356

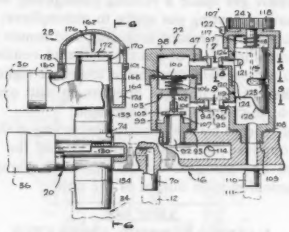
Division of Ser. No. 218,337, Jan. 17, 1972, Pat. No. 3,814,091. This application Mar. 7, 1974, Ser. No. 448,816
Int. Cl.² F16K *51/00*
U.S. Cl. 137—613 **5 Claims**

1. Overflow valve means useful in a general anesthesia rebreathing system including a breathing circuit, for exhausting gas therefrom, said overflow valve means comprising:
a valve housing having an input port, a control port, and an exhaust port and including means for communicating said input port with the gas pressure in at least a portion of said circuit;

valve element means in said housing normally operative to permit gas flow from said input port to said exhaust port in response to a positive differential pressure thereacross exceeding a first threshold;

means responsive to a control pressure applied to said control port exceeding a second threshold for closing said valve element means and preventing said normal operation thereof; and

controller means for selectively coupling different pressure sources to said control port, said controller means including at least first and second input ports and an output port;



means coupling said controller means output port to said valve housing control port;

said controller means further including manually actuatable means movable between first and second positions for respectively communicating said first and second input ports with said output port and means responsive to said manually actuatable means for varying the rate of gas flow through said valve housing exhaust port.

3,938,552

REGULATED FLUID TAP PARTICULARLY USEFUL AS WATER TRICKLER NOZZLE

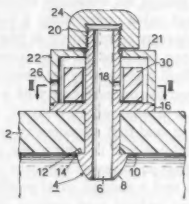
Peretz Rosenberg, Moshav Beit Shearim, Israel

Filed May 25, 1973, Ser. No. 364,049

Claims priority, application Israel, June 2, 1972, 39593; Aug. 25, 1972, 40202

Int. Cl.² B05B 1/08

U.S. Cl. 137—624.14 **9 Claims**



1. A fluid-flow control device comprising a conduit member connectable to a source of pressurized fluid to be controlled and including an inlet opening, an axial passageway, and an outlet opening through which the fluid flows, and a regulating member movable towards and away from the conduit member outlet opening to close and open same and thereby to control the flow of fluid therethrough; the regulating member being unattached and freely supported by the device so as to be freely movable within limit positions with respect to the conduit member; the face of the conduit member in which the outlet opening is formed being curved, and the face of the regulating member closing the outlet opening also being curved but with a different curvature from that of the conduit member face, such that in said limit positions of the regulating member, its curved face diverges from the curved conduit member face outwardly from the periphery of the outlet opening formed in the latter face to provide a spacing between the two curved faces which increases from the periphery of the outlet opening outwardly thereof, whereby as the regulating member moves away from the conduit member outlet opening to permit the fluid to flow therethrough, a pressure gradient is produced which is lower at the periphery of said opening than outwardly thereof, and which therefore tends to move the regulating member towards the conduit member outlet to close same, said pressure gradient acting with the fluid force to set the regulating member into rapid vibratory movement towards and away from the conduit member outlet opening during the flow of fluid therethrough.

3,938,553

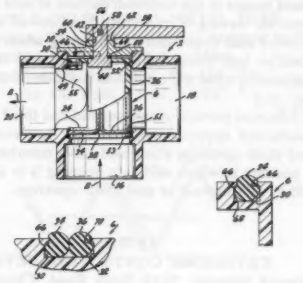
VALVE CONSTRUCTION

Robert Ortega, 18194 Aztec Court, Fountain Valley, Calif. 92708

Filed Nov. 8, 1973, Ser. No. 413,841

Int. Cl.² F16K 11/085

U.S. Cl. 137—625.47 **6 Claims**



1. A valve comprising:

a valve body having a cavity, a first opening, a second opening and a third opening;

a valve member rotatably positioned within said cavity;

said valve member having a generally cylindrical exterior surface and a hollow configuration with an end opening in alignment with said first opening;

a side opening in said valve member positioned at substantially a right angle with respect to said end opening with the valve member positioned for rotation about a cylindrical axis to bring the side opening into or out of alignment with the second opening or the third opening so as to establish flow communication between said first and second openings or between said first and third openings;

said side opening having a width which is sufficient to span the distance between said second and third openings such that the valve is always open with flow communication being provided between said first opening and both said second and third openings when the valve member is in an intermediate position in which said side opening is out of alignment with said second opening and out of alignment with said third opening;

a first groove in said exterior surface positioned in a substantially uniform spaced relation with respect to said end opening;

a second groove in said exterior surface positioned in a substantially uniform spaced relation to said side opening;

a portion of said second groove positioned at substantially a right angle to said first groove and a portion of said second groove being common to said first groove;

a third groove in said exterior surface;

said third groove positioned in a substantially uniform spaced relation about said third opening when said side opening is in alignment with said second opening;

said third groove positioned in a substantially uniform spaced relation about said second opening when said side opening is in alignment with said third opening;

said second groove positioned in a substantially uniform spaced relation about said third opening when said side opening is in alignment with said third opening;

a portion of said third groove positioned at substantially a right angle to said first groove;

a portion of said third groove being common to said first groove;

seal means retained in said first, second and third grooves;

the portion of said second groove which is substantially perpendicular to said first groove being common to the portion of said third groove which is substantially perpendicular to said first groove;

the seal means in the common portion of said second and third grooves performing a dual function of forming a positive seal about said side opening and also forming a positive seal between said second and third openings;

the seal means in the common portion of said first and second grooves serving a common function of maintaining a positive seal about both said end opening and said side opening;

the seal means in the common portion of said first and third grooves serving a common function of maintaining a positive seal about said end opening while maintaining a positive seal about said second or said third openings depending upon the rotational position of the valve member, and

said common portion of said second and third grooves being positioned approximately midway between said second and third openings when said valve member is rotated to a position in which said side opening is in alignment with either said second or said third openings.

3,938,554

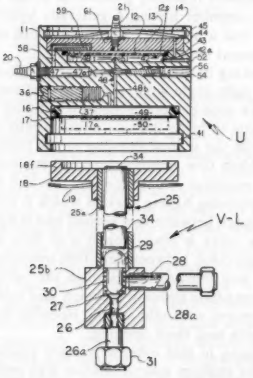
CRYOGENIC CONTROLLER DEVICE

W. Edward Samuels, 3119 Essex Road, Cleveland Heights, Ohio 44118

Filed June 24, 1974, Ser. No. 482,338

Int. Cl.² F16K *31/385, 11/07*

U.S. Cl. 137—625.61 **27 Claims**



1. A gas energized fluidic controller unit responsive to gas pressure signals to produce a mechanical motion output, said controller unit comprising:

a housing including a body and providing

a first chamber for a sensor diaphragm, and

a second chamber for a power diaphragm;

a sensor diaphragm mounted in the body and spanning said first chamber to define

a sensor gas space on one side of the sensor diaphragm;

a sensor signal gas line connection on the housing communicating with said sensor gas space

to shift the sensor diaphragm responsively to sensor signal gas pressure;

a power diaphragm mounted in the body and spanning said second chamber to define on one side of the power diaphragm

a power diaphragm operating gas space;

an energizing gas connection on the body as a gas inlet and in constant communication with said operating gas space and sensor gas space a venting passageway in said body from said operating gas space to atmosphere;

venting controlling means including said sensor diaphragm for controlling flow of gas through said venting passageway to atmosphere responsive to sensor signal gas pressure thereby varying gas pressure in said operating gas space to shift the power diaphragm;

means supported by said housing including a shiftable element opposed to the said other side of the power diaphragm and shiftable by the power diaphragm for the mechanical motion output of the unit.

3,938,555

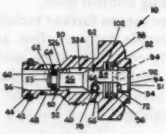
VALVE OVERRIDE APPARATUS

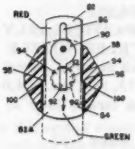
Louis A. Swickley, Cuyahoga Falls, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.

Filed Mar. 21, 1974, Ser. No. 453,435

Int. Cl.² F16K *1/32;* **F15B** *15/26*

U.S. Cl. 137—625.67 **22 Claims**

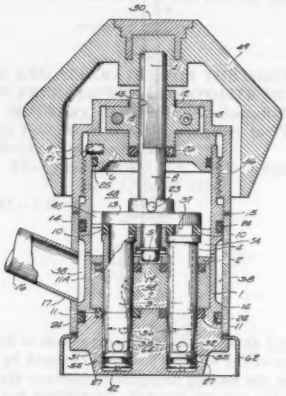




1. A fluid valve means for manually controlling the operation of another fluid valve comprising: a valve body portion having a first passageway terminating at one end at a surface and at the other end adapted to communicate with a fluid source; a second fluid passageway intersecting said first passageway and adapted to communicate with a fluid passageway of the fluid valve it is adapted to control; a plunger axially movably mounted in said first passageway and being movable between a first axial position in which one of its ends is contained within said first passageway adjacent to the said surface of said valve body and a second axial position in which said one end is recessed behind said surface of said body; said plunger in said first axial position permitting fluid flow between said other end of said first passageway and said second passageway, and said plunger in said second axial position preventing fluid flow between said other end of said first passageway and said second passageway; positioning means for holding said plunger in said second axial position; and axial movement limiting means for preventing said plunger from extending out of said first passageway; said positioning means including an elongated member slidably mounted for movement between first and second positions across the path of axial movement of said plunger; said member including a pair of apertures, one of said two apertures having a width less than the width of said plunger, said one aperture being in axial alignment with said plunger when said member is in said second position and said plunger is in said second axial posi-

tion, the other of said two apertures being in alignment with said plunger when said member is in said first position and said plunger is in said first axial position.

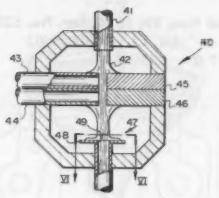
3,938,556
FAUCET
Glenn W. Hicks, 2749 N. 75th St., Milwaukee, Wis. 53210
Filed Dec. 12, 1973, Ser. No. 423,914
Int. Cl.[2] F16K *11/18*
U.S. Cl. 137—636.4 **17 Claims**



12. A mixing valve comprising:
means defining a hollow housing,
means within said housing defining a pair of cylindrical valve chambers closed at their lower ends and open at their upper ends to the interior of said housing, one of said chambers having a cold water inlet port formed intermediate the ends thereof and the other of said chambers having a hot water inlet port formed intermediate the ends thereof,
hollow cylindrical valve spool means slidably disposed within each chamber, said spool means being closed at their lower ends and open at their upper ends to said housing interior and each having at least one lateral opening therethrough coupling its associated chamber with said spool means interior, each said spool means closing one of said water inlet ports to fluid flow when in a first lowered position and the lateral opening in each spool permitting flow through its associated port when said spool means is in a second raised position,
rotatable body means disposed within said housing for selectively opening and closing said open ends of said spool means to fluid flow,
means engaging said spool means for moving said spool means from said first to said second position; and
outlet port formed in said housing.

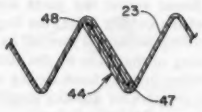
3,938,557
LIQUID FLUIDIC DEVICE
J. Douglas Malcolm, St. John's, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada
Filed Mar. 20, 1975, Ser. No. 560,243
Int. Cl.[2] F15G *1/14*
U.S. Cl. 137—834 **14 Claims**

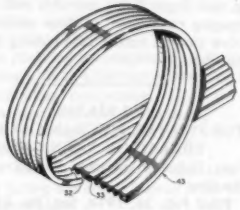
1. A liquid fluid operated control device comprising:
a. an emitter nozzle for coupling to a liquid supply source and operative to issue a free liquid emitter jet having a Weber number of from 8 to 70;
b. control means comprising a control nozzle disposed such that one end thereof terminates within the emitter jet, said nozzle being disposed a distance of less than five emitter jet diameters downstream from the emitter nozzle, said nozzle being operative to issue a control jet for deflecting the emitter jet; and



c. receiver means spaced downstream from the emitter for receiving the emitter jet.

3,938,558
FLEXIBLE CYLINDRICAL METAL TUBE
Leroy E. Anderson, Detroit Lakes, Minn., assignor to Manufacturers Systems, Inc., Detroit Lakes, Minn.
Filed Oct. 26, 1973, Ser. No. 410,234
Int. Cl.[2] F16L *11/00, 11/16*
U.S. Cl. 138—122 **8 Claims**



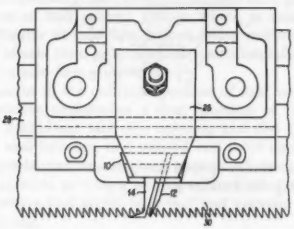


1. A corrugated cylindrical tube comprised of a strip of formable material helically wound into contiguous convolutions and defining a tube having adjacent circumferentially extending corrugations therein, said corrugations each having a bottom bounded by opposed radially extending legs, said strip having marginal portions each with a free edge supported at opposite sides thereof and reversed upon itself in opposite directions to form a U-shaped seam element at each side thereof having opposed legs, the free edge of each of said marginal portions being received between the legs of one of said seam elements of the convolution of said strip contiguous thereto and thereby cooperatively defining a radially extending seam and comprising a common leg of a corrugation for the contiguous convolutions of said strip, each of said seam elements extending into the bottom of the adjacent corrugation of the contiguous convolution of said strip and abutting against the other leg of said adjacent corrugation in locked-in relation.

3,938,559
METHOD OF MAKING PILE FABRICS AND THE PILE FABRIC MADE THEREBY

Geoffrey Wilson Dewhirst, Broughty Ferry, Scotland, assignor to Thomson Shepherd and Company Limited, Angus, Scotland

Filed Nov. 29, 1974, Ser. No. 528,130
Int. Cl.² D03D *39/02*
U.S. Cl. 139—7 R **7 Claims**



1. A method of increasing the tuft length in an Axminster gripper loom having yarn carriers and a gripper associated with each carrier, comprising the steps of:

a. gripping a plurality of yarns in the grippers,
b. drawing yarn off the yarn carriers by relative movement between the carriers and grippers,
c. moving a cutting knife across the yarns to cut them, and
d. moving a finger across the yarns simultaneously with movement of the cutting knife, the finger engaging each yarn and drawing additional yarn off its respective carrier prior to cutting of that yarn by the cutting knife.

3. In an Axminster gripper loom having relatively movable yarn carriers and grippers for drawing lengths of yarn from the yarn carriers, an assembly comprising:

a. a cutting knife movable across the yarns to cut them, and
b. a finger spaced forwardly of said cutting knife with respect to the direction of movement of the knife during cutting, said finger being movable with said cutting knife for engaging each yarn, to draw additional yarn off its respective carrier, before said cutting knife engages and cuts that yarn.

3,938,560
APPARATUS FOR THE MECHANICAL OPERATION OF THREAD OR YARN GUIDES

William Eger Nyboe Lauritsen, Strandvagen 22, 443 00 Lerum, Sweden

Filed Feb. 26, 1974, Ser. No. 446,042
Claims priority, application Sweden, Mar. 5, 1973, 7302989
Int. Cl.² D03C *3/00*
U.S. Cl. 139—59 **9 Claims**

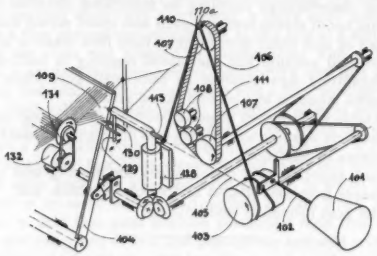
1. An apparatus for the mechanical operation of yarn guides comprising, selectors mounted at one end of the yarn guides, said selectors being operable in response to external pulses to respectively permit and prevent shifting of the said yarn guides from given positions, a pair of locking studs on each of said yarn guides, operating means continuously reciprocating between extreme dead center positions for shifting said yarn guides, said operating means including means for engaging said locking studs for positively shifting said yarn guides in both directions into and out of two extreme positions and a central position, spring means tending to move said yarn guides from said extreme positions, cooperating catch means on said yarn guides and on said selectors for releasably retaining said yarn guides in said extreme positions, said locking studs being adapted in response to the position of the associated selector to be respectively locked to and left unlocked from said operating means, the distance between said catch means on said yarn guides and said locking studs and the distance between said dead center positions of said operating means and said catch means on said selectors being such that as said operating means reaches said dead center positions, said yarn guides are moved a short distance against the action of said spring means whereby a form-closed engagement between said studs and selectors is canceled, said yarn guides

being carried along by said operating means in the event that the position of the selector has been changed by an external pulse, while the locking engagement between the yarn guide and selector is only momentarily interrupted and the operating means returns without actuating the respective yarn guides when the selector position remains unchanged.

3,938,561
DEVICE FOR DRAWING OFF WEFT THREAD

Walter Scheffel, Industriestrasse 53, Weissenburg, Bavaria, Germany

Division of Ser. No. 200,955, Nov. 22, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,402
Claims priority, application Germany, Apr. 10, 1971, 2117705
Int. Cl.² D03D *47/36, 47/28*
U.S. Cl. 139—122 H **3 Claims**



1. In a loom provided with weft thread supply bobbin means for weft thread and a warp shed into which constant lengths of weft thread are to be inserted, continuously operated draw roller means for drawing the weft thread from the supply bobbin means, fluid-pressure, weft inserting means for fluid-expressing and inserting weft thread in the warp shed, said draw roller means and said fluid-pressure weft inserting means defining a rectilinear path of travel therebetween, and continuously operated weft thread deflecting means located between said draw roller means and weft thread inserting means con-

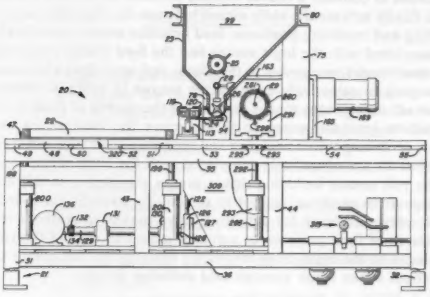
tinuously forming a weft loop of variable size for storage and supply purposes, said weft thread deflecting means including endless belt means having a path of travel movable substantially transversely from and beyond the rectilinear weft thread path of travel between the continuously-operated draw roller means and the weft thread inserting means, a deflecting member on the endless belt means movable therewith and engaging with the weft thread during movement of the endless belt means both toward and away from the rectilinear path of travel of said weft thread thereby positively controlling the variable size weft thread loop during both formation of the loop and insertion of the weft thread into the warp shed.

3,938,562

METHOD AND APPARATUS FOR THE DISTRIBUTION OF NON FREE-FLOWING COMPOSITE MIXTURES

Daniel R. McGillvary, Massillon, and Joseph E. Sumerak, Cuyahoga Falls, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 17, 1975, Ser. No. 541,966
Int. Cl.² B65B *1/04*
U.S. Cl. 141—1 R **18 Claims**



14. A method for the distribution of composite mixtures onto a collection surface from a reservoir having a plurality of apertures comprising the steps of:

cavitating the mixture within said reservoir;

comminuting agglomerations of the mixture within said reservoir;

feeding the mixture through said apertures;

further comminuting and distributing the mixture as it exits from said apertures; and,

moving the collection surface relative to said reservoir to receive the mixture fed therefrom.

3,938,563

FUNNEL WITH AUTOMATIC AIR BLEEDING AND VALVED OUTLET

Kurt Gall, Welfenstrasse 22, 7 Stuttgart-Birkach, Germany

Filed June 24, 1974, Ser. No. 482,635
Claims priority, application Germany, June 26, 1973, 2332359; Aug. 4, 1973, 2339585
Int. Cl.² B65B *39/04*
U.S. Cl. 141—298 **7 Claims**

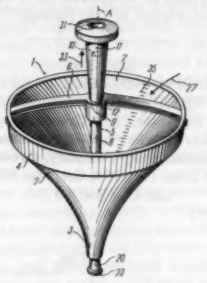
1. A funnel comprising:

a downwardly tapered shell having a narrow lower outlet and a wide upper mouth;

a tube extending substantially through said shell and having an open lower end adjacent said outlet and an upper end above said mouth, said tube being straight and formed between said ends with a lateral opening;

a support on said shell spanning said mouth holding said tube around said upper end thereof; and

a downwardly extending tubular annular skirt on said support spacedly surrounding said tube at the level of said



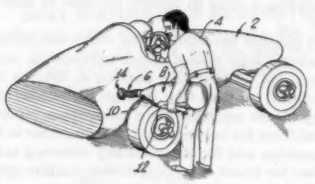
opening whereby fluid rising in said tube and issuing from said opening is deflected by said shield into said shell.

3,938,564

QUICK-RELEASE FUEL COUPLING FOR RACING CARS

Kendall Jones, North Hollywood, Calif., assignor to Kaiser Aerospace and Electronics Corporation, Irvine, Calif.

Filed Jan. 6, 1975, Ser. No. 538,736
Int. Cl.² B65B *3/07*
U.S. Cl. 141—352 **6 Claims**



1. A releasable coupling for connecting a fluid supply unit to a fluid receiving unit to minimize spillage of fluid during coupling and uncoupling, comprising:

a housing connected with one of the units;

a passage in said housing communicating with the one unit and having an open end;

a valve seat in said passage having upstream and downstream sides facing toward and away from the open end thereof, respectively;

a plunger resiliently biased against the downstream side of said valve seat to close the same;

a tubular probe connected at one of its ends with the other of the units;

a nose;

a stem connected to said probe supporting said nose in concentric, spaced adjacent relation to the opposite end of said probe;

a sliding sleeve surrounding said probe resiliently biased into sealing contact with said nose at one end of said sleeve to prevent fluid flow outwardly of said probe, said probe being insertable into said passage to move said nose against said plunger thereby unseating the same from said valve seat, insertion of said probe seating an outer peripheral surface of said sleeve against the upstream side of said valve seat, further inward movement of said nose through said valve seat separating said sleeve from said nose to enable fluid flow through said probe and said valve seat; and

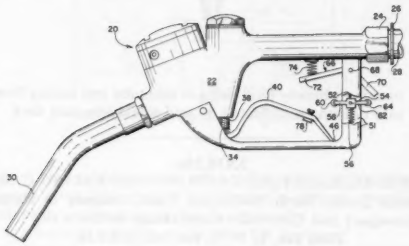
joint means mounted in said stem for enabling said nose to move freely out of concentric alignment with said probe

thereby enabling said nose to move out of a trapped position against the downstream side of said valve seat when said probe is withdrawn in a condition of axial misalignment relative to said passage.

3,938,565
FLUID DISPENSING NOZZLE INCLUDING TRIGGER RETAINING MECHANISM

George Dennis Robinson, Jr., Greensboro, and Hal Craig Hartsell, Jr., Kernersville, both of N.C., assignors to Gilbert & Barker Manufacturing Company, Greensboro, N.C.

Filed June 17, 1974, Ser. No. 480,156
Int. Cl.² B65B 3/04
U.S. Cl. 141—392 10 Claims



1. In combination with a manually operable fluid dispensing nozzle including a valve to control the flow of fluid through the nozzle:

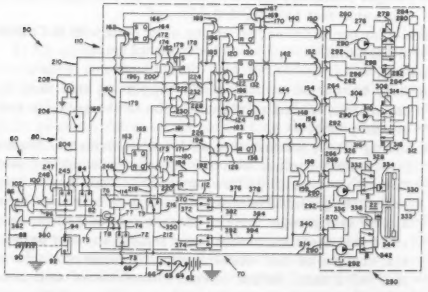
a trigger member mounted on the nozzle for movement by a relatively high manual force between an inoperative position and an operative position to actuate the valve and control the fluid flow through the nozzle; and

retaining means operable by a continuous relatively low manual force for holding said trigger member in its operative position and for automatically releasing said trigger member for return to its inoperative position upon termination of the relatively low manual force.

3,938,566
TREE HARVESTER DELIMBING CONTROL

Garn Farley Penfold, East Moline, Ill., and Andrew Paul Redman, Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 21, 1975, Ser. No. 570,203
Int. Cl.² A01G 23/08; B27L 1/00
U.S. Cl. 144—2 Z 28 Claims

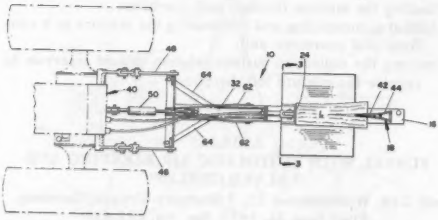


15. In a tree harvesting machine having main frame means elongated in a normal fore-and-aft direction of travel supported by ground engaging means, delimber means mounted on the forward end portion of said frame means and including fluidly actuated knife means for receiving and encircling and delimbing a tree as the latter is fed endwise therethrough, feed means mounted on said frame means behind said delimber means and fluidly movable for receiving and engaging a tree and including rotatable roll means engageable with main drive means for propelling a tree through said delimber means, and extendable and retractable tree handling means mounted on said frame means for manipulating a tree into a position for introducing the butt end portion thereof into said delimber and feed means, a control system comprising: a source of electrical energy; automatic control means connected to the source for producing a start and reset signals; logic circuitry means connected to the source including means responsive to the start signal for selectively providing sequentially a close-delimber, close-feed, and engage-drive electrical outputs and the close-feed, engage-drive, and close-delimber electrical out-puts and including means responsive to the reset signal to block the close-delimber, close-feed and engage-drive electrical outputs and to provide and subsequently to block an open-delimber and open-feed electrical outputs, delimber actuator means operatively associated with the logic means and the delimber means including driver means responsive to the close- and open-delimber electrical outputs to selectively connect the source to solenoid means for actuating valve means to connect a source of fluid pressure to actuate means to fluidly actuate the knife means between its respective encircling and receiving positions; feed actuator means operatively associated with the logic means and the feed means including driver means responsive to the close- and open-feed electrical outputs to selectively connect the source to solenoid means for actuating valve means to connect the source of fluid pressure to actuator means to fluidly move the feed means between its respective engaging and receiving positions; and feed drive means operatively associated with the logic means and the roll means including driver means responsive to the engage-drive electrical output to selectively connect the source to solenoid means for actuating valve means to connect the source of fluid pressure to actuator means to engage the roll means to the main drive means for rotating the roll means to propel a tree trunk through said delimber means.

3,938,567
TRACTOR MOUNTED LOG SPLITTER

Arnold D. Dircksen, and David H. Dircksen, both of Rte. 1, Spring Valley, Ohio 45370

Filed Mar. 29, 1974, Ser. No. 456,005
Int. Cl.² B27L 7/00
U.S. Cl. 144—193 A 6 Claims



1. A log splitter adapted to be supported by and operated from a tractor comprising an I-beam providing a base member adapted to support a log to be split, a connector frame at one end of said base member to effect cantilevered support of said base member from a tractor, log abutment means slidably mounted on said base member adapted to engage one end of a log, a wedge-shaped member on said base in opposed relation to said abutment means and adapted to engage the opposite end of a log, drive means on said base having power transfer means connectable to a tractor power system and operatively connected to said abutment means for sliding said abutment means on said base member to thereby effect rela-

tive movement between said abutment means and said wedge-shaped member to force said wedge-shaped member through a log, and ramp means connected to the web of said I-beam and extending outwardly and downwardly therefrom to facilitate the rolling of a log onto said base member and to stabilize the base member when resting on the ground.

3,938,568

APPARATUS FOR DEBARKING LOGS

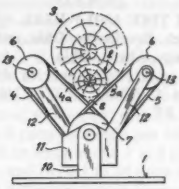
Wilhelm Härdtle, Poststrasse 21, 7959 Waln, Krs. Biberach an der Riss, Germany

Filed Feb. 5, 1975, Ser. No. 547,373

Claims priority, application Germany, Feb. 6, 1974, 2405639

Int. Cl.² B27L *1/00;* **B65G** *47/00, 15/14*

U.S. Cl. 144—208 F **14 Claims**



1. An apparatus for rotating a log for removal therefrom by a tool of bark and the like, said apparatus comprising:

at least two longitudinally and horizontally spaced frames;

a pair of horizontally and transversely spaced upper wheels on each of said frames;

at least one lower wheel on each frame below and between the respective upper wheels;

at least one endless conveyor element spanned over the wheels on each frame and having a pair of inner stretches defining a V in line with the inner stretches on the other frame and forming with the other inner stretches a log-receiving cradle;

drive means for displacing said element to rotate a log received in said cradle, two such lower wheels and two such conveyor belts each being spanned over a respective upper wheel and a respective lower wheel are provid 1 on each frame, said lower wheels of each frame being coaxially coupled.

3,938,569

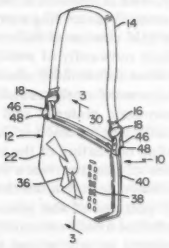
HANDBAG

Lawrence E. Hill, 5815 Robison, Cincinnati, Ohio 45213

Filed Apr. 15, 1974, Ser. No. 460,943

Int. Cl.² A45C *3/06*

U.S. Cl. 150—33 **1 Claim**



1. A combination handbag and cushion comprising first and second outside wear-resistant covers forming the exterior sides thereof, a one piece U-shaped liner comprising a closed lower portion and first and second side portions, said first liner side portion having its upper peripheral edge secured to the upper peripheral edge of said first outside wear-resistant cover, said second liner side portion having its upper peripheral edge secured to the upper peripheral edge of second outside wear-resistant cover, a zipper fixedly secured between the upper peripheral edges of said first and second outside wear-resistant covers to provide access to the interior of said handbag, allowance edged being provided on the remaining peripheral edges of said first and second outside wear-resistant covers, said allowance edges of said first and second outside wear-resistant covers being secured together, piping means contained within said secured allowance edges, cushioning means for protecting objects carried within said handbag from damage when the article is used as a cushion and further providing comfort for the user when seated thereon, said cushioning means comprising a first cushion pad fixedly secured to said first outer wear-resistant cover between said first outer wear resistant cover and said first liner side portion, and a second cushion pad fixedly secured to said second outer wear-resistant cover and said second liner side portion, said cushion pads covering the entire area of said outside wear-resistant covers, a level central bottom portion, substantially parallel to said upper peripheral edge, said bottom portion having upwardly and outwardly extending end portions connected with substantially vertical side edges whereby objects placed within said handbag will fall to the bottom and be directed by said upwardly outwardly extending portions toward said level central bottom portion thereby concentrating said objects in a smaller area and facilitating locating said objects by the user, and a strap secured to said device for transporting the device when used as handbag.

3,938,570

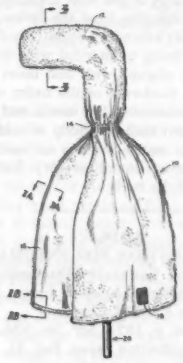
DUAL PURPOSE CLUB HEAD COVER

Edra J. Stewart, 1404 Paula Drive, Apopka, Fla. 32703

Filed June 28, 1974, Ser. No. 484,343

Int. Cl.² A63B *57/00;* **B65D** *65/02*

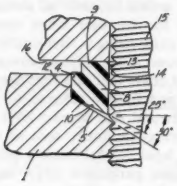
U.S. Cl. 150—52 G **6 Claims**



1. A dual purpose club head cover serving not only to protect the club, but also providing a means readily available to the golfer for wiping the ball and club prior to play, said cover comprising a head-engaging portion, an elasticized waist portion below said head-engaging portion adapted to grasp the shaft of the club, and a skirt portion extending below said waist portion for a considerable extent, said head-engaging, waist, and skirt portions being made from a single piece of absorbent material, said skirt portion being of a length approximately equal to or greater than the length of the head-engaging portion of said cover, thereby providing the golfer as easily available ball wiping surface, said skirt portion being of suffi-

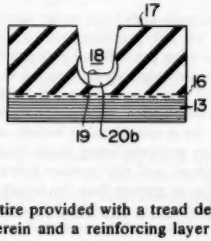
cient lateral dimension as to extend loosely around the shaft of the club, and means for enabling a user to secure said skirt portion in a furled condition about the shaft of the club.

3,938,571
NUT WITH SEALING INSERT
Robert N. Heighberger, c/o Jos. Dyson & Sons, Inc., 33300 Lakeland Blvd., Eastlake, Ohio 44094
Filed July 15, 1974, Ser. No. 488,269
Int. Cl.² F16B *39/34*
U.S. Cl. 151—7 **1 Claim**



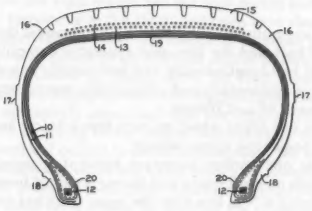
1. In sealing and locking means of the class described, in combination, a nut body having threads internally thereof, a male threaded device engaging the internal threads, an insert cavity in one end of said body, said cavity including a cylindrical section and a conical portion extending inwardly toward the axis of the body from the inner end of the section at a first angle, said section being knurled, and an insert of material having an excellent elastic memory and lubricity in said cavity with a conical portion at one end lying at a lesser angle than that of the cavity conical portion mentioned for the entire peripheral extent thereof, the planes of said portion and section intersecting at the inner end of the section aforesaid, the conical section of the insert comprising the locking element thereof, said insert having a central opening defining a cylindrical inner surface, the diameter of said inner surface being slightly greater than that of the root diameter of the internal threads, said insert extending from the cavity, a sealing collar integral with the insert extending oppositely from the conical portion, said collar being cylindrical with the inner surface thereof being axially aligned with said inner surface of said insert and of a wall thickness of the order of magnitude of one-half the wall thickness of the insert, and of substantially less longitudinal extent than the body of said insert, the end surface of said collar and a surface on said male threaded device having engaging complimentary flat surfaces, each normal to the axis of the body.

3,938,572
CRACK PREVENTION FOR PNEUMATIC TIRE
Takuji Nishi, Isehara; Kenhachi Mitsuhashi, and Tadanobu Nagumo, both of Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co. Ltd., Japan
Filed Dec. 6, 1974, Ser. No. 530,283
Claims priority, application Japan, Dec. 31, 1973, 48-1337
Int. Cl.² B60C *11/12*
U.S. Cl. 152—209 R **3 Claims**



1. A pneumatic tire provided with a tread defined by walls having grooves therein and a reinforcing layer placed under said tread, characterized in that said grooves are provided with a plurality of slots in their bottom portions, said slots extending in the direction at a right angle to the lengthwise direction of said grooves, said slots extending completely about the bottom of said grooves up to the mid-point of the walls of said groove through corner and center portions of the bottom portion of the groove for preventing the growth of cracks created in said bottom portion, the depth of said slots being not more than 4/5 the distance covering from the bottom surface of said groove to the top boundary of said reinforcing layer but not less than 1 mm, the width of said slots being not more than 2 mm, and the pitch of said slots being not more than 20 mm but not less than 5 mm.

3,938,573
RUN FLAT TIRE AND WHEEL ASSEMBLY
Victor L. Hallenbeck, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Apr. 11, 1974, Ser. No. 459,872
Int. Cl.² B60C *17/00, 21/08*
U.S. Cl. 152—330 RF **4 Claims**



1. A combination comprising:
a. a wheel having a tire-mounting rim with axially spaced bead seats;
b. a pneumatic tire mounted on the rim having
1. a carcass reinforced with radially extending cords, the carcass having
i. two axially spaced bead portions in which the carcass terminates
ii. two axially spaced sidewall portions, one adjacent to each bead portion, and
iii. a crown portion intermediate the sidewall portions,
2. a circumferentially extending restrictive belt radially outwardly of said carcass at the crown portion,
3. a tread radially outwardly of said belt, and
4. a layer of closed cell cellular elastomeric material
5. a layer of substance on the radially inner side of said cellular elastomeric material said layer of substance having a coefficient of friction sufficient to prevent tearing, chafing or heating of the internal sidewall and bead portions of the tire when run in a completely deflated condition, in which the tire is flattened against the rim and portions of the internal surface of each sidewall are folded axially outwardly into contact under the weight resting on the tire and both said layers covering the entire inner surface of the bead portions, sidewall portions and crown portion;
c. an adhesive cementing the bead portions of said tire to the bead seats of said rim to prevent separation of the beads and rim when the tire is run in the completely deflated condition.

3,938,574

VULCANIZABLE RUBBER MIXTURE FOR TIRE TREADS HAVING IMPROVED SKID RESISTANCE

Kurt Burmester, Overath-Steinenbruck; Siegfried Wolff, Bornheim-Merten; Erhard Klotzer, Putzbrunn-Solalinden, and Friedrich Thurn, Rodenkirchen, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation-in-part of Ser. No. 514,318, Oct. 11, 1974, abandoned. This application Nov. 21, 1974, Ser. No. 526,063

Claims priority, application Austria, Oct. 11, 1973, 8692/73

Int. Cl.² B60C *5/00, 11/14;* **C08K** *5/01;* **C08L** *7/00*

U.S. Cl. 152—330 R **23 Claims**

1. A vulcanizable rubber mixture suitable for skid resistant tire treads comprising (1) a rubber, 20 to 100% of the total rubber being polybutadiene rubber and 80 to 0% of the rubber being a sulfur vulcanizable synthetic rubber other than polybutadiene or being natural rubber, (2) silica filler in an amount of 20 to 200 parts by weight per 100 parts of rubber with the proviso that if carbon black is also present the amount of silica is 40 to 200 parts by weight per 100 parts of rubber, (3) plasticizer oil in an amount of 40 to 100 parts by weight per 100 parts of rubber, (4) sulfur or a sulfur donor in an amount of 0.2 to 8 parts by weight per 100 parts of rubber, (5) an accelerator in an amount of 0.1 to 8 parts by weight per 100 parts of rubber, and (6) 0.1 to 25 parts by weight per 100 parts of rubber of a sulfur containing organosilane having the formula Z—alk—S_n—alk—Z in which

Z is (1) —Si(R₁)(R₁)(R₂),

(2) —Si(R₁)(R₂)(R₂), or

(3) —Si(R₂)(R₂)(R₂)

in which R_1 is alkyl of 1 to 4 carbon atoms, cycloalkyl of 5 to 8 carbon atoms or phenyl, R_2 is alkoxy of 1 to 8 carbon atoms or cycloalkoxy of 5 to 8 carbon atoms, alk is a divalent hydrocarbon group of 1 to 8 carbon atoms, and n is a number of 2 to 6.

3,938,575

PNEUMATIC TIRES

Jacques Boileau, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, France

Filed Apr. 9, 1975, Ser. No. 566,280

Claims priority, application France, Apr. 11, 1974, 74.12898

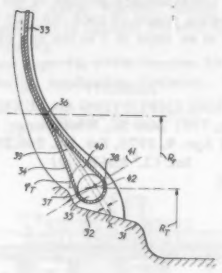
Int. Cl.² B60C *15/00, 9/02*

U.S. Cl. 152—362 R **5 Claims**

1. In a pneumatic tire with a crown reinforcement formed of at least two crossed oblique plies of cables and a carcass reinforcement comprising at least one ply of radial cables the portion of which folded around the bead ring terminates in a part which is parallel to the carcass reinforcement, the improvement which comprises:

a. the equilibrium curve of the carcass reinforcement passes between the center of gravity of the radial section of the bead ring and the point of contact of the carcass ply with the radial cross section of the bead ring, and

b. the end of the radius from which the folded-over portion assumes an arrangement parallel to the carcass reinforcement is located at a distance from the center of gravity of



the radial section of the bead ring of between 1/5 and ⅓ of the height of the pneumatic tire on its rim.

3,938,576

RIMS FOR PNEUMATIC TIRES

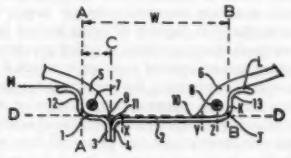
William Eric Mitchell, Coventry, England, assignor to Dunlop Limited, London, England

Filed Dec. 14, 1973, Ser. No. 424,827

Claims priority, application United Kingdom, Dec. 15, 1972, 58156/72

Int. Cl.² B60B *25/00*

U.S. Cl. 152—379 R **6 Claims**



1. A rim for a pneumatic tire and rim assembly which may be used when the tire is in a deflated state comprising an outboard rim part and an inboard rim part detachably secured together, the profile of the outboard rim part considered in a plane containing the axis of the rim comprising, in sequence, a radially extending bead retaining flange having a radially outer edge which is turned axially outwardly of the rim to provide a support surface of substantial axial width for the sidewall of a pneumatic tire, a curved seating region for the heel of a tire bead extending into a frusto-conical bead seating region tapering radially inwardly towards the axially inner region of the rim and extending axially inwardly to a radially inwardly curving bead toe seating region having a radius of curvature in the range 5 to 9 millimeters; the curved toe seating region terminating in a plane spaced axially at a distance in the range 18 to 20 millimeters from the plane of the inner surface of the bead retaining flange, the inboard rim part being joined to the outboard rim part in the plane of termination of the said curved toe seating region and when considered in a plane containing the axis of the rim having a profile adjacent said plane of termination which substantially mirrors that of said curved toe seating region and leads into an axially extending base portion having a diameter lying in the range 2 to 3 millimeters less than the nominal rim diameter as measured at the point where the plane of the inner surface of the bead retaining flange joins a line tangential to the inclined bead seating portion, the base portion terminating in a second frusto-conical bead seating region which increases in diameter towards the end remote from the outboard rim part, the sec-

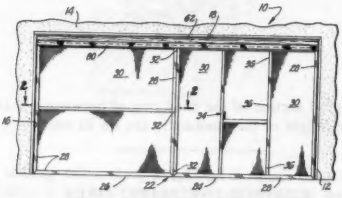
ond bead seating region terminating in a curved heel seating region and tire bead retaining flange the profiles of which considered in a plane containing the axis of the rim substantially mirror the corresponding profiles of the outboard rim part, the bead seating region of each rim part being inclined radially inwardly at an angle of 5°to the axis of the rim.

3,938,577

DOOR STRUCTURE EMPLOYING AN AUXILIARY DOOR

Stanzer Richards, 7791 24th St., Westminster, Calif. 92683

Filed Apr. 9, 1975, Ser. No. 566,297
Int. Cl.² E06B 9/01
U.S. Cl. 160—90 11 Claims



1. In the combination of a principal door, first mounting means for supporting said principal door, a door frame defining a door opening, said first mounting means supporting said principal door so that it is capable of being moved between a substantially vertical closed position in which it extends across said door opening and a substantially horizontal opened position adjacent to the top of said door opening, an auxiliary door, an auxiliary mounting means for supporting said auxiliary door, said auxiliary mounting means supporting said auxiliary door so that it is capable of being moved between a substantially vertical closed position in which it extends across said door opening and an opened position in which it does not extend across said door opening, the improvement comprises:

said auxiliary mounting means serving to support said auxiliary door on said principal door so that said auxiliary door is moved concurrently with said principal door when said principal door is moved between its closed and opened positions,

said auxiliary mounting means also supporting said auxiliary door on said principal door so that when said principal door is in its opened position said auxiliary door can be moved relative to said principal door from an opened position adjacent to said principal door to said closed position of said auxiliary door.

3,938,578

METHOD FOR MAKING FOUNDRY MOULDS AND CORES UTILIZING A GAS CATALYST

David Epstein; Leslie A. Watkins, and John W. J. Bugg, all of London, England, assignors to The White Sea & Baltic Company Limited, London, England

Filed Feb. 13, 1974, Ser. No. 442,302
Claims priority, application United Kingdom, Feb. 20, 1973, 8388/73
Int. Cl.² B22C 9/12
U.S. Cl. 164—16 6 Claims

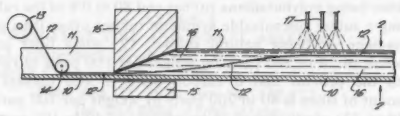
1. A method for making foundry moulds or cores comprising putting a mixture of foundry sand and a binder hardenable by use of an acidic catalyst into a mould or core box, passing an acidic gas through the mixture thereby causing the binder to harden, removing the mould or core from the box and applying to the surface of the mould or core a composition comprising a material which will neutralise acidic gases or which will adsorb such gases, said composition being applied in an amount effective to neutralise or adsorb at least a substantial proportion of the acidic gases released from the mould or core before and during casting.

3,938,579

METHOD OF PRODUCING COMPOSITE BEARING MATERIALS

Charles Fraser Old; Michael George Nicholas, both of Wantage, England, and Brian Wilfred Howlett, deceased, late of Newbury, England, by Margaret Howlett, administratrix, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Sept. 10, 1971, Ser. No. 179,341
Claims priority, application United Kingdom, Sept. 10, 1970, 43459/70
Int. Cl.² B22D 11/00
U.S. Cl. 164—87 8 Claims



1. A process for the continuous manufacture of carbon fiber reinforced shell bearings which process comprises:

a. providing a continuous casting furnace and spaced therefrom, a cooling station comprising a water quench;

b. supplying continuously to said furnace a continuous trough of a backing material;

c. supplying longitudinally of the internal base of said trough in said furnace continuous carbon fibers in the form of a tow, the fibers of said tow being supplied across the width of said trough;

d. supplying in said trough in said furnace, molten bearing metal at a temperature at which it wets said carbon fibers, whereby said carbon fibers are incorporated in said molten bearing metal;

e. passing said trough containing said molten bearing metal and incorporated carbon fibers from said furnace to said cooling station, during which passage the carbon fibers rise through said molten bearing metal to approach the surface of said molten bearing metal; and

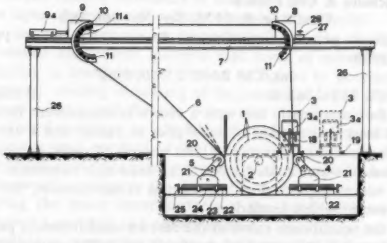
f. cooling and solidifying said molten bearing in said cooling station by quenching with water to form the shell bearing product in the form of a continuous strip of bearing metal containing incorporated therein continuous carbon fibers concentrated near the surface of said bearing.

3,938,580

CONTINUOUS METAL CASTING PLANT WITH CONTROLLED BAND-TENSIONING

Enrico Donini, C.so Indipendenza 6, 20129 Milan, Italy

Filed June 26, 1974, Ser. No. 483,439
Claims priority, application Italy, June 28, 1973, 25990/73
Int. Cl.² B22D 11/06
U.S. Cl. 164—154 11 Claims



1. In a system for the continuous casting of elongated metal elements from hot molten metal, a combination comprising a casting wheel having an axis and a peripheral groove; a metal-

lic endless band entrained about a portion of the circumference of said wheel so as to overlie said groove in said portion and define a casting chamber therewith; crucible means including a nozzle for admitting hot molten metal into said casting chamber; band-tensioning means including a horizontal track and a pair of band-supporting members slidable on said track and each having roller means for entraining said band at locations spaced from said wheel, said band-tensioning means also having means for fixedly securing one of said members to said track and control means for moving the other of said members along said track, said control means including sensor means for sensing the tension of said band and piston means connected with said other member and cooperating with said sensor means to move said other member away from said one member and thereby maintain said band tensioned; and a pair of band-presser means disposed on opposite sides of said axis for respectively pressing said band against the circumferential surface of said wheel, each of said band-presser means having a movable carriage, a multi-hinged arm and a pulley on said arm.

3,938,581

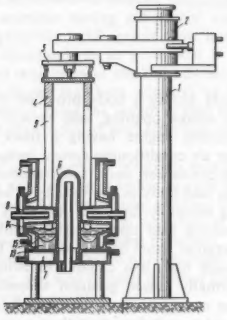
PLANT FOR ELECTROSLAG MELTING OF HOLLOW METAL INGOTS

Volf Iudovich Rabinovich, ulitsa Gagarina, 74, kv. 27; Jury Nikolaevich Kriger, ulitsa Oktyabrskaya, 38, kv. 59, both of Chekhov, Moskovskoi oblasti; Igor Alexandrovich Svitenko, Teply stan, 5 mikroraion, korpus 61, kv. 149, Moscow, and Vladimir Alexeevich Karpov, ulitsa Gagarina, 43, kv. 39, Chekhov, Moskovskoi oblasti, all of U.S.S.R.

Filed June 28, 1974, Ser. No. 484,226

Int. Cl.² B22D *27/02*

U.S. Cl. 164—252 **10 Claims**



1. A plant for electroslag melting of hollow metal ingots, comprising: a supporting structure; a carriage mounted on said supporting structure movably in the vertical direction; an electrode holder fastened on said carriage; means for casting a hollow metal ingot including a base plate, a mold arranged on said base plate, and a core secured on said mold; at least one side core for shaping a cavity opening to the external side surface of the ingot, said core being inserted through the mold; a hollow consumable electrode having at least one through slot along its length, which slot having a width and length sufficient to accommodate said side core with a clearance.

3,938,582

ARRANGEMENT FOR CONTINUOUS MANUFACTURE OF METAL INGOTS IN A MOLD WITH OPEN BOTTOM

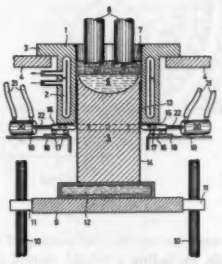
Wolfgang Schwartz-Domke, Bornheim-Roisdorf; Helmut Grüf, Bruchkobel, and Anton Wamser, Hanau am Main, all of Germany, assignors to Leybold Heraeus GmbH & Co. KG, Cologne, Germany

Filed Sept. 12, 1974, Ser. No. 505,485

Claims priority, application Germany, Sept. 13, 1973, 2346038

Int. Cl.² B22D *27/02*

U.S. Cl. 164—252 **11 Claims**



1. An arrangement for continuous production of metal ingots by progressive crystallization below a slag layer in a mold comprising, in combination, a mold having an open bottom; and a plurality of blocking elements immediately below the bottom edge of the mold and distributed along the periphery of the mold, said blocking elements being moveable in the direction of the ingot surface, the edges and surfaces of said blocking elements facing the ingot being adapted to the shape of the ingot cross section, an annular gap prevailing between the ingot surface and the hollow space in the mold, said annular gap being substantially tightly sealed by said blocking elements.

3,938,583

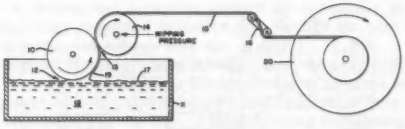
APPARATUS FOR PRODUCTION OF CONTINUOUS METAL FILAMENTS

Sheldon Kavesh, Whippany, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 348,814, April 6, 1973, Pat. No. 3,856,074. This application Oct. 17, 1974, Ser. No. 515,740

Int. Cl.² B22D *11/06*

U.S. Cl. 164—276 **4 Claims**



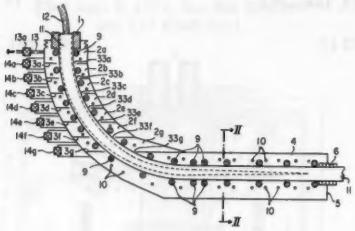
1. In an apparatus for the production of a solid metal filament from a molten source using a quenching wheel as a quenching element, the improvement which comprises a pressure exerting means for pressing the metal filament against the quenching wheel at a point just beyond the point of solidification of the filament on the quenching wheel, thereby creating a tension-free zone and inhibiting premature detachment of the filament from the quenching wheel.

3,938,584

APPARATUS FOR COOLING CONTINUOUS CASTINGS

Jean-Luc Charles Meylan, 45, Chemin Moise-Duboule, 1211 Geneva, Switzerland

Division of Ser. No. 260,773, June 8, 1972, Pat. No. 3,848,656.
This application Sept. 5, 1974, Ser. No. 503,358
Claims priority, application Switzerland, June 9, 1971, 8423/71
Int. Cl.² B22D *11/12*
U.S. Cl. 164—283 S 13 Claims



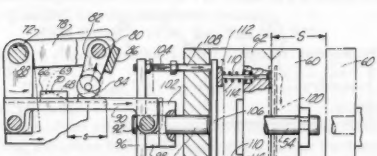
1. In an apparatus for continuous casting of strands, particularly steel strands, including a mould, mould cooling means, a set of guide rollers arranged to guide the strand coming out of the mould along a desired path, and means for cooling and advancing the strand along its path, an improvement wherein at least in a portion of the zone of solidification of the strand after the mould, the set of guide rollers is arranged in an airtight chamber provided with injection nozzles for cooling liquid, the chamber having opposite ends with a seal at each end and at least one outlet opening equipped with flow control valve means, said guide rollers being arranged to guide the strand coming out of the mould along a first path in which the strand has a vertical component of travel and then along a second substantially horizontal path, said airtight pressurized chamber surrounding the rollers in said first path being divided into compartments separated from one another by horizontal partitions each provided with an opening for the passage of the strand, each compartment being provided on both sides of said path with at least one said injection nozzle for cooling liquid, said compartments being connected to one another through pressure control valve means.

3,938,585

GRID EJECTION MECHANISM FOR A BATTERY GRID CASTING MACHINE

Robert R. Rader, Port Huron, Mich., assignor to Wirtz Manufacturing Company, Inc., Port Huron, Mich.

Filed Jan. 4, 1974, Ser. No. 430,887
Int. Cl.² B22D *17/22, 29/00*
U.S. Cl. 164—347 20 Claims



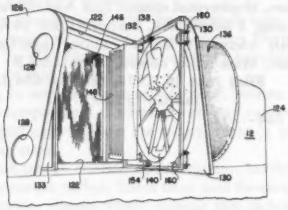
1. In a battery grid casting machine which includes a stationary mold member and a movable mold member movable through a predetermined distance toward and away from the stationary mold member to open and close the mold, the combination comprising, a reciprocating mechanism connected to the movable mold member and movable through said predetermined distance to open and close the mold, said stationary mold member having a plurality of reciprocable grid knock-out pins thereon movable from a retracted to a projected position for ejecting a cast grid from the stationary mold member, means for actuating said pins and means operatively interconnecting said reciprocating mechanism with said actuating means and operable during the first half to three-quarters of the mold opening stroke to shift said pins to the fully projected position within said fraction of the mold opening stroke and thereby eject the grid.

3,938,586

SWINGABLE ROTARY SCREEN

G. Benjamin Barlow, East Moline, and Chester G. Wolfe, Moline, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed June 29, 1973, Ser. No. 375,192
Int. Cl.² F01P *3/04*
U.S. Cl. 165—51 2 Claims



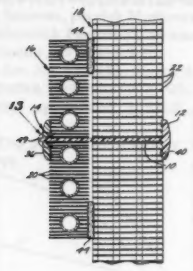
1. In a vehicle having a body provided with a generally rectangular air intake opening, said vehicle embodying an internal combustion engine having a fixed heat exchange radiator, and an air conditioning system including a movable heat exchange condenser core, said radiator being fixedly mounted within said body in the vicinity of said opening and said core being normally disposed outwardly of the radiator immediately behind said opening and within said body, a generally rectangular panel having one edge thereof hingedly connected to said body and capable of swinging movement between a normally closed position wherein it covers the opening and an open extended position wherein it uncovers the opening, said core being pivotally mounted on said body for swinging movement between its normal position and an extended position wherein it projects outwardly of said opening, said panel being formed with a relatively large central opening therein, a rotary air screen of the blanking baffle type carried by said panel and cooperating with said central opening, and means operatively connecting said panel and condenser core for swinging movement in unison between their normal and extended positions, said means comprising at least one tie rod pivotally connected at one end to the panel and at the other end to the outer edge region of the core, and wherein the panel and condenser core are pivoted to the vehicle body for swinging movement about respective closely spaced parallel axes and the portion of the body which extends between said axes, in combination with said core, panel and tie rod, define, in effect, an elongated four-bar linkage which, when the panel and core are in their normal positions is substantially collapsed, and when the panel and core are extended define a trapezoid.

3,938,587

COOLER FASTENING SYSTEM

David R. Vian, Rialto, Calif., assignor to Hayden Trans-Cooler, Inc., Corona, Calif.

Filed Jan. 6, 1975, Ser. No. 538,574
Int. Cl.[2] F28F 7/00
U.S. Cl. 165—76 19 Claims



1. In a power system having an engine, heat exchanger structure comprising at least one generally flat heat exchanger mounted in fixed relationship to said engine for cooling liquid associated with said engine, and a generally flat oil cooler structure for cooling oil associated with said engine, said structures being of the type having fins and perforations arranged generally normal to the general planes thereof,

a fastening system for mounting said oil cooler structure in stacked relationship on one side of said heat exchanger structure, which comprises

an elongated, thin, generally straight tension member which is sufficiently long and thin to extend through perforations in said structures and to project beyond the free sides of the structures in stacked relationship,

said tension member having substantial column strength and being generally rigid against gross lateral bending in all lateral directions so as to enable it to be pushed through said structures in stacked relationship,

a pair of abutment members adapted to be secured at spaced positions along the length of said tension member on opposite free sides of said structure in stacked relationship,

at least one of said abutment members being longitudinally movable on said tension member toward the other abutment member into a tensioning position of the fastening system wherein said tension member is placed under tension between said abutment members,

and locking means engageable between said movable abutment member and said tension member for locking them in said tensioning position.

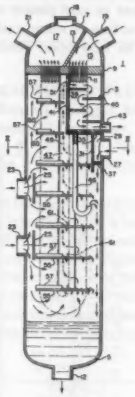
3,938,588

DEAERATING FEEDWATER HEATER

Roland L. Colt, Swarthmore, and Robert G. Slebodnick, Collingdale, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 18, 1973, Ser. No. 407,723
Int. Cl. F28b 1/02, 9/10
U.S. Cl. 165—113 8 Claims

1. A feedwater heater adapted to remove non-condensible gases from condensate drain fluid fed thereto, said heater comprising a tubular shell portion; a plurality of tubes forming a tube bundle so disposed in said shell portion that feedwater flows through the tubes when the heater is operating to form a cold leg portion and a hot leg portion; a steam inlet nozzle disposed in said shell; a condensate drain fluid inlet nozzle disposed in said shell; impingement protecting means disposed adjacent said condensate drain fluid inlet nozzle for protecting the tubes against the direct impingement of said influent condensate drain fluid; means for dispersing said influent condensate drain fluid; said dispersing means being so disposed to effectuate admixing of the dispersed condensate drain fluid with influent steam; vent condensing means disposed to encompass a portion of the cold leg and having baffles disposed therein to cause the fluid flowing therethrough to follow a sinuous path over the tubes in order to condense steam from non-condensible gases and means for venting the non-condensible gases therefrom; and a single U-shaped trough generally centrally disposed with respect to the tube bundle and generally extending lengthwise along the entire length of the tube



bundle, said trough being in direct fluid communication with the vent condensing means and with the cold leg portion of the tube bundle, said trough having leg portions each of which extend into the cold leg portion of the tube bundle, subtending a portion of the tubes therein, whereby, when the heater is operable influent steam advixes with the dispersed condensate drain fluid driving the non-condensible gases out of solution, and the steam and non-condensible gases must flow over tubes of the cold leg portion to enter the trough and then flow via the trough to the vent condensing means, wherein steam is condensed and non-condensible gases are vented from the feedwater heater.

3,938,589

DRILLING TOOL

James D. Mott, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Division of Ser. No. 201,878, Nov. 24, 1971, Pat. No. 3,783,942. This application Oct. 3, 1973, Ser. No. 403,204
Int. Cl.[2] E21B 43/12; F16K 17/00
U.S. Cl. 166—224 A 18 Claims

1. A drilling tool apparatus adapted for connection in a drilling string to control undesired flow through the bore of the drill string including:

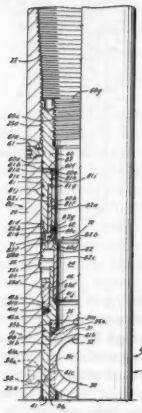
a tubular member having a longitudinal bore extending therethrough and means for connection at its upper and lower ends in a drill string with said longitudinal bore in alignment with the bore of the drill string for forming a longitudinal flow passage through said tubular member;

bore closure means movably disposed in said bore of said tubular member for movement to and from an open position for enabling flow of fluid through said longitudinal bore of said tubular member and a closed position for blocking flow of fluid through said longitudinal bore of said tubular member;

means operably connected with said bore closure means for effecting movement of said bore closure means to the open and closed positions, said means including:

piston means forming a longitudinally extending flow passage aligned with said longitudinal bore of said tubular member for providing a longitudinal flow path through the drilling tool and having a first pressure responsive surface exposed to fluid pressure in said bore of said tubular member above said bore closure means for urging on said first pressure responsive surface to effect movement of said piston means in a first direction for moving said bore closure means to the open position to enable flow of fluid through said longitudinal bore;

means sealing with said first pressure responsive surface for increasing the pressure responsive surface area exposed to the fluid pressure as said piston means commences to move in a first direction to move said bore closure means from said closed to said open position for moving said



bore closure means in said bore to control flow of fluid through said bore wherein the fluid pressure in said bore effects positive movement of said bore closure means to the open position;

said piston means having a second pressure responsive surface for urging movement of said piston means in a second direction for moving said bore closure means to the closed position;

a flow channel formed in said tubular member and extending from a location on an exterior surface of said tubular member to communicate the pressure adjacent said tubular member with said second pressure responsive surface wherein the pressure adjacent said tubular member urges said piston means to move in the second direction and said bore closure means to move to block flow through said bore of said drill string;

means mounted with said tubular member for urging movement of said piston sleeve in the second direction to move said bore closure means to the closed position to predetermine the pressure in said bore of said tubular member exceeding the pressure adjacent the exterior of said tubular member communicated into said expansible chamber to commence to move said piston means in the first direction; and

said piston means carrying said bore closure means when moving in the first direction for effecting movement of said bore closure means relative to said piston means to move said bore closure means to the open position.

3,938,590

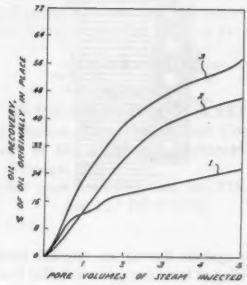
METHOD FOR RECOVERING VISCOUS ASPHALTIC OR BITUMINOUS PETROLEUM

David A. Redford, Fort Saskatchewan, and David L. Mitchell, Edmonton, both of Canada, assignors to Texaco Exploration Canada Ltd., Calgary, Canada

Filed June 26, 1974, Ser. No. 483,173

Int. Cl.² E21B *43/22, 43/24, 43/26*

U.S. Cl. 166—270 **11 Claims**



1. A method of recovering viscous, asphaltic or bituminous petroleum from a permeable, subterranean, viscous asphaltic or bituminous petroleum-containing formation including a tar sand deposit, penetrated by at least one well in fluid communication with the formation comprising:

a. forming a zone of increased permeability in at least a portion of the formation,

b. introducing chlorine gas into said zone of increased permeability to oxidize labile groups on the bituminous petroleum, to form surface active agents in the formation,

c. introducing an alkalinity agent into said zone of increased permeability to neutralize oxidized groups generated by action of the chlorine gas,

d. introducing into the formation a recovery fluid selected from the group consisting of steam, a mixture of steam and an oxygen containing gas including air, a mixture of steam and ammonia, or a mixture of steam, ammonia and an oxygen containing gas, and

e. recovering formation petroleum from the formation.

3,938,591

INTERMEDIATE FLUID SYSTEMS FOR LONG DISTANCE OIL DISPLACEMENT

Paul S. Ossip, Denver, and Karl D. Dreher, Littleton, both of Colo., assignors to Marathon Oil Company, Littleton, Colo.

Filed Mar. 7, 1975, Ser. No. 556,514

Int. Cl.² E21B *43/22*

U.S. Cl. 166—275 **9 Claims**

1. In a process for recovery of petroleum from formations by drilling into said formations at least one injection well and at least one production well spaced a distance from said injection well, and injecting fluids into said injection well to displace petroleum toward said production well and recovering petroleum from said production well, the improvement comprising injecting displacement fluids comprising intermediate micellar systems which substantially are immiscible with oil and water in the formation, said micellar systems having electrical conductivities in the range of from about 10^{-6} to about 0.04 ohm^{-1} $centimeters^{-1}$, in an amount equivalent to from about 1 to about 25 percent of the pore volume of said formation.

3,938,592

ROCK-EXPLOITATION METHOD BASED ON THERMODYNAMIC CYCLES UTILIZING IN-SITU ENERGY SOURCE

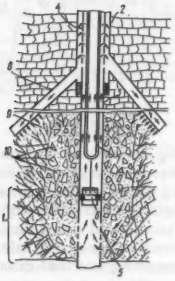
Ivan Timofeevich Aladiev, ulitsa Georiu-Dezh, 3, kv. 11; Kirill Dmitrievich Voskresensky, Komsomolsky prospekt, 14/1, kv. 79, both of Moscow; Gennady Petrovich Gukov, ulitsa Lesneya, 6, kv. 13, Moskovskaya, poselek Vidnoe; Evgeny Valentinovich Saperov, poselok Moskvorechie, 52, kv. 4, and Valery Kombolatovich Fardzinov, Strastnoi bulvar 13-A, kv. 42, both of Moscow, all of U.S.S.R.

Continuation of Ser. No. 122,483, March 9, 1971, abandoned. This application Nov. 12, 1973, Ser. No. 414,772

Claims priority, application U.S.S.R., Mar. 23, 1970, 1416581

Int. Cl.² E21B *43/26*, *43/24*; F28D *21/00*

U.S. Cl. 166—299 8 Claims



7. A rock-exploitation method based on thermodynamic cycles utilizing an in-situ energy source, comprising: sinking at least one well as far down as a producing horizon; admitting stratal fluid into said well, said fluid being contained in the rock and being in contact therewith; discharging said fluid from the well above the producing horizon into a fluid permeable rock mass, said fluid being utilized as a heat-carrying medium in an underground circuit which includes means for admission of fluid into the well; a section of the well between the fluid inlet and the fluid outlet, and the fluid-permeable rock mass adjacent to said well section; injecting a heat-carrying agent into said well where it circulates, the temperature of said heat-carrying agent being higher than the temperature of said fluid containing in the rock of said producing horizon; said heat-carrying agent being cooled by said fluid within said well section.

3,938,593

PROCESS FOR TREATMENT OF WELLS WITH ACID HALIDES

Robert H. Friedman, Houston, Tex., assignor to Getty Oil Company, Los Angeles, Calif.

Filed Mar. 11, 1974, Ser. No. 449,771

Int. Cl.² E21B *43/27*

U.S. Cl. 166—307 10 Claims

1. A process for chemical treatment of wells comprising:

providing an acidizing composition which includes an acid halide of the formula

where X is a halogen and R is selected from the group consisting of methyl, ethyl, propyl and butyl;

injecting said composition through the well bore, into the subterranean formation surrounding the well;

said composition reacting with the water in situ in said formation to form a mixture of two acids, RCOOH and HX, which mixture is effective to chemically react with formation materials to increase the permeability of the formation.

3,938,594

FRACTURING FLUID

John S. Rhudy, and Bruce L. Knight, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Apr. 8, 1974, Ser. No. 458,740

Int. Cl.² E21B *43/26*

U.S. Cl. 166—308 18 Claims

1. A process for fracturing a subterranean formation penetrated by at least one injection well wherein an aqueous fracturing fluid comprised of a high molecular weight polyacrylamide polymer is injected into the formation, the steps comprising injecting into the formation at sufficient rate and pressure to fracture the formation an aqueous solution of a high molecular weight polyacrylamide polymer that is gelled in the presence of chromic ion prior to injection of the polymer into the formation.

3,938,595

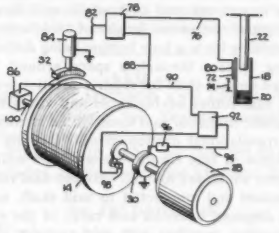
APPARATUS AND METHOD FOR DRIVING BULB PILES

William J. Swenson, Houston, Tex., assignor to Raymond International, Inc., Houston, Tex.

Filed Sept. 19, 1974, Ser. No. 507,558

Int. Cl.² E21B *1/04*

U.S. Cl. 173—1 12 Claims



10. A method of forming a pile with a pile hammer rig including a crane having a hoisting drum, a clutch, driving means for said drum through said clutch, braking means for the drum, a drop-weight, a hoisting rope leading from said drum to said drop-weight, said method comprising the steps of engaging said clutch means to lift said drop-weight to a preselected height by winding the rope on the drum, disengaging said clutch means for releasing said drop-weight to start its free fall, automatically sensing when the drop-weight approaches the bottom of its stroke, and transmitting a signal for engaging said braking means, automatically sensing the rotation of said drum and transmitting a signal when the rotation of said drum terminates for releasing said braking means and for re-engaging said clutch means.

3,938,596
TURBO-DRILL

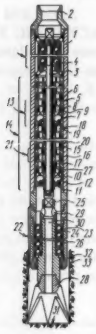
Evgeny Illarinovich Ivanov, 2 Setunsky proezd, 4, kv. 150, Moscow; Viktor Semenovich Olthow, ulitsa Karla Marksa, 30, kv. 8, Perm; Evgeny Dmitrievich Kostyrya, ulitsa Truda, 43, kv. 75, Perm, and Nikolai Dmitrievich Derkach, ulitsa Stakhanova 40, kv. 66, Perm, all of U.S.S.R.

Continuation of Ser. No. 341,115, March 14, 1973, abandoned. This application May 14, 1974, Ser. No. 469,901

Claims priority, application U.S.S.R., Mar. 15, 1972, 1759137. The portion of the term of this patent subsequent to Aug. 28, 1990, has been disclaimed.

Int. Cl.[2] F01D *15/12*

U.S. Cl. 173—73 **2 Claims**



1. A turbo-drill comprising: a housing including means at its upper end for connection to the lower end of a string of drill pipes; a shaft disposed in said housing on supports including means for mounting a drill bit; a supporting unit to transmit the force to the drilling bit from said string of drill pipes, said supporting unit being arranged under said housing with said shaft arranged therein and connecting the shaft to the drilling bit; stators secured in said housing and provided with races and vanes forming guiding channels for passing therethrough a flushing fluid pumped from the surface through said string of drill pipes to activate said turbo-drill, said flushing fluid flowing throughout the entire lenght of said turbo-drill and through said drilling bit to a hole bottom being drilled, and the fluid returning upward through a space around the pipes; rotors mounted on said shaft for relative rotation with respect to said shaft, said rotors having races and vanes facing in a direction opposite to that of said vanes of the stators for transforming the translational motion of said flushing fluid into rotational motion of said rotors; carriers with rolling bodies disposed therein which are located between said races of said stators and rotors and connected to said shaft, said rolling bodies being disposed between said races of the stators and rotors and forming, together with said carriers, stators and rotors, reduction stages of an axial reduction turbine wherein said rotors form a driving inner wheel, said stators forming an outer wheel, and said rolling bodies forming idlers, said races of the rotors being located in an operative position above the respective races of the stators, as a result of which downward axial force developing on said rotors during the translational motion of the flushing fluid through said reduction stages presses said rolling bodies against said races of the stators and rotors so that contact friction forces are generated between said rolling bodies and said races of the stators and rotors and transmit torque through the idler elements to the drilling bit, the stator vanes forming channels for the passage of flushing fluid, and the rotors having vanes face in a direction opposite to that of said vanes of the stators, forming reductionless stages of the turbine and are mounted between and above said reduction stages so that the stators are fixedly positioned in said housing, and the rotors are mounted on the shaft and adapted to move axially so as to be pressed with their lower end faces, under the effect of the downward axial force generated during the translational motion of the flushing fluid on the vanes of said rotors of the reductionless stages of the turbine to the upper end faces of the rotors of the underlying reduction stages, thereby increasing the force with which said rolling bodies are pressed against said races of the stators and rotors of the reduction stages.

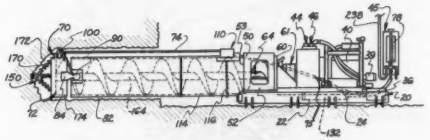
3,938,597
PORTABLE EARTH BORING MACHINE

Albert R. Richmond, West Salem, and William S. Appleman, Ashland, both of Ohio, assignors to The Richmond Manufacturing Company, Ashland, Ohio

Continuation-in-part of Ser. No. 471,440, May 20, 1974. This application Nov. 29, 1974, Ser. No. 528,464

Int. Cl.[2] E21B *7/10*

U.S. Cl. 175—24 **8 Claims**



1. In an earth boring apparatus of the type that forms horizontal holes and pushes sections of casing into said holes, the combination of casing means including a lead casing section including a first longitudinal axis; a second casing section rearwardly adjacent to said lead casing section and including a longitudinal axis normally aligned with said first longitudinal axis; pivot means connecting said lead casing section to said second casing section; actuating means connected to said lead casing section for varying the angle of said first longitudinal axis of said lead casing section relative to said second longitudinal axis of said second casing section; sensing means for progressive extension into the earth fill; gauge means for location adjacent the earth fill and connected to the sensing means, said gauge means including read-out indicia for informing the operator of grade deviations of the sensing means; and automatic control means for energizing said actuating means responsive to sensing of a deviation in grade by said sensing means.

3,938,598
BELLING APPARATUS

James P. Watts, 6930 E. Pinchot Ave., Scottsdale, Ariz. 85251

Filed May 14, 1975, Ser. No. 577,300

Int. Cl.[2] E21B *3/08*; E02D *17/14*

U.S. Cl. 175—99 **12 Claims**

1. In apparatus for cutting a bell shaped recess in an earth formation in the lower end of a cylindrical pier bore which enters said formation from the ground surface;

a. an upper fixed cylindrical housing in the upper portion of said pier bore,

b. anchoring devices on said housing for holding the housing against rotation relative to the pier bore,

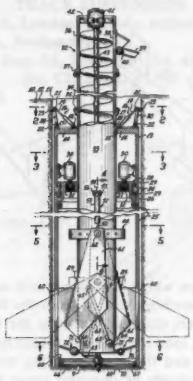
c. a lower rotating housing connected to the lower end of said upper housing and extending substantially to the bottom of said pier bore, said lower housing being formed with a slot adjacent to its lower end,

d. drive means for rotating said lower housing under power,

e. an auger casing coaxial with said housing, spaced therefrom and extending from a point above the ground surface to a level a small distance above the bottom of the pier bore,

f. a discharge port in said auger casing above said ground surface;

g. an auger in said auger casing
h. power means for rotating said auger,
i. a collar rotatably and axially moveable on said auger casing,
j. power means for moving said collar axially on said auger casing,
k. a blade having its upper end pivoted to said collar in a position in which the lower portion of the blade may be swung through the slot in the rotating housing,



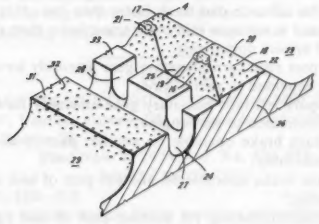
l. an eccentric link having an upper end pivoted to said blade between the ends thereof and a lower end pivoted to said rotating housing whereby downward movement of said collar causes the lower portion of said blade to be swung outwardly through said slot;
m. a feed port in the lower end of said auger casing and a feeding device on said auger casing at said feed port for feeding spoil from said slot through the feed port to the auger.

3,938,599

ROTARY DRILL BIT

Curtis L. Horn, Houston, Tex., assignor to Hycalog, Inc., Houston, Tex.

Filed Mar. 27, 1974, Ser. No. 455,339
Int. Cl.² E21B *9/36*
U.S. Cl. 175—329 **11 Claims**



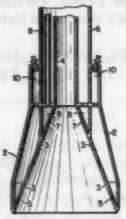
1. In a rotary bit, a body having a lower face and a central passage means for receiving a drilling fluid; a plurality of discrete cutting "teeth" disposed on said face and arranged in circumferentially spaced generally radially extending rows, each of said teeth having a leading face and a tip and adjacent ones of the teeth having a valley therebetween, each of said teeth having a diamond-like element in its leading face and at least at its tip; and fluid courses extending from said passage means along the leading faces of said teeth and arranged to discharge fluid along the leading faces of said teeth, the fluid courses including primary grooves in said face spaced circumferentially ahead of a row of teeth and a plurality of secondary grooves extending from the primary grooves to the leading faces of the teeth.

3,938,600

HYDRAULIC MINING NOZZLE-AIR LIFT DEVICE

Donald E. Essmeier, New Orleans, La., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 379,671, July 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 181,896, Sept. 20, 1971, abandoned. This application Feb. 26, 1975, Ser. No. 553,386
Int. Cl.² E21B *7/18*
U.S. Cl. 175—422 **7 Claims**



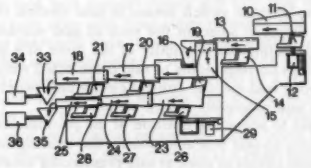
1. A hydraulic nozzle for setting a hollow piling in a subsurface soil formation comprising:
a. a cutting envelope formed by a sheath of generally circular cross section open at its front end and partially closed at its rear end by an annular partition;
b. an evacuation conduit extending rearwardly of said annular partition and providing fluid communication from the interior of said cutting envelope through said annular partition;
c. first hydraulic jet means adapted to project hydraulic fluid toward the front opening of said sheath;
d. first hydraulic fluid conduit means for supplying hydraulic fluid to said first hydraulic jet means;
e. reverse hydraulic jet means projecting rearwardly from said nozzle and adapted to remove soil from above and maintain clearance behind said nozzle; and
f. secondary hydraulic fluid supply means for providing hydraulic fluid to said reverse hydraulic jet means.

3,938,601

WEIGHING METHOD AND APPARATUS

Jack Hobart, Leamington Spa, England, assignor to Hobart Engineering Limited, England

Filed July 17, 1974, Ser. No. 489,833
Claims priority, application United Kingdom, July 17, 1973, 34038/73
Int. Cl.² G01G *13/02*
U.S. Cl. 177—1 **9 Claims**



1. A method of weighing a product made up of irregular pieces into a batch of predetermined weight, including grading a flow of the irregular pieces to separate smaller-sized pieces from the flow, conveying the remaining flow of pieces towards a weighing device, delivering pieces from the remaining flow

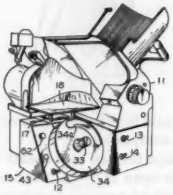
to a first weighing station of the weighing device until a batch of the product is accumulated having a weight slightly less than said predetermined weight, subsequently transferring the batch to a second weighing station of the weighing device for determining when the batch just achieves the said predetermined weight, and adding the smaller-sized pieces to the second weighing station whilst pieces are being delivered from the remaining flow to the first weighing station for accumulating the next batch.

3,938,602

SLICING SYSTEM WITH AUTOMATIC PORTION WEIGHT CONTROL

Eugene L. Sly, P.O. Box 19545, Portland, Oreg. 97219, and Dean R. Salmans, 5007 Wildwood Drive, North Bend, Oreg. 97459

Filed July 19, 1974, Ser. No. 490,419
Int. Cl.² G01G *13/02*, *21/10*; B26D *7/00*, *7/06*
U.S. Cl. 177—116 **3 Claims**



1. In a system for slicing food products into accurately controlled individually sized portions of preselected weight, the combination comprising:

a. automatic slicing means for slicing a food product into a number of slices to constitute an individually sized portion,

b. electric motor means operably connected to said slicing means for operating the same,

c. electric circuit means for connecting said electric motor means to a source of electric power,

d. scale means operably associated with said slicing means for weighing said slices of food product, said scale means comprising a movable receiving platform disposed below the slicing means for receiving said slices dropped thereonto by gravity from the slicing means, and a movable pointer for indicating the weight of said slices received on said receiving platform,

e. electric motor control switch means in the electric circuit means of the motor means for selectively opening and closing said circuit means for activating and deactivating the motor means,

f. electric actuator means for said switch means, the actuator means having an electric control circuit,

g. photosensitive switch means in said electric control circuit disposed adjacent the path of said movable pointer for detecting the proximity of the same at a preselected location corresponding to said preselected weight and for opening said electric control circuit and switch means to stop said automatic slicing means,

h. means to adjust the position of the photosensitive means relative to said movable pointer for causing said electric control circuit to open at said preselected location of said pointer, and

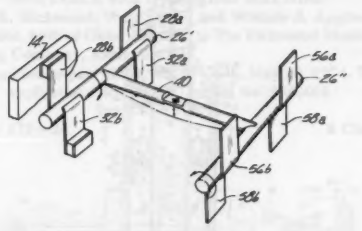
i. time delay means in the electric control circuit for delaying actuation of the electric motor control switch means by the photosensitive switch means for a period of time sufficient to allow recovery of pointer oscillation beyond said preselected location resulting from the dropping of food slices onto the receiving platform.

3,938,603

CONSTANT MOMENT WEIGH SCALE WITH FLOATING FLEXURE BEAM

Ralph S. Shoberg, Farmington Hills, and Thomas A. Ulicny, Dearborn, both of Mich., assignors to GSE Inc., Farmington Hills, Mich.

Filed Dec. 30, 1974, Ser. No. 537,090
Int. Cl.² G01G *3/14*
U.S. Cl. 177—211 **18 Claims**



1. Floating beam weigh scale apparatus comprising: a base, a load receiving member spaced from the base, first and second pivot members disposed between the base and load receiving members, load transmitting means interconnecting the pivots, the base, and the load receiving member to produce moments in the pivots of opposite sense and about spaced axes, a substantially rigid beam connected to and extending between the pivots, and means carried by the beam for producing a signal related to the bending stress therein over the elastic bending range thereof.

3,938,604

SYSTEM FOR STEERING AND DRIVING A FULL-TRACK VEHICLE

Artur Kugler, Hainhofen, near Augsburg, and Franz Xaver Zaunberger, Augsburg, both of Germany, assignors to Zahnraderfabrik Renk Aktiengesellschaft, Augsburg, Germany

Filed Mar. 17, 1975, Ser. No. 559,229
Claims priority, application Germany, Mar. 15, 1974, 2412562
Int. Cl.² B62D *11/10*
U.S. Cl. 180—6.44 **10 Claims**

1. A steering and drive system for a tracked vehicle having an engine connected to a pair of tracks through a pair of differentials interconnected by a steering shaft rotatable in one sense to advance one track faster than the other and in another sense to advance said other track faster than said one track, said system comprising:

a three-part right-turn planetary gear assembly having one part connected to said engine;

a three-part left-turn planetary gear assembly having one part connected to said engine;

a right-turn brake operable on another part of said right-turn assembly;

a left-turn brake operable on another part of said left-turn assembly;

a link interconnecting yet another part of said right-turn assembly with yet another part of said left-turn assembly;

a variable-speed transmission having an input side connected to said engine and an output side;

a three-part primary planetary gear assembly having one part connected to said steering shaft and another part connected to said output side;

a primary brake operable on yet another part of said primary assembly;

a three-part intermediate planetary gear assembly having one part connected to said steering shaft, another part connected to said output side, and yet another part connected to said link; and

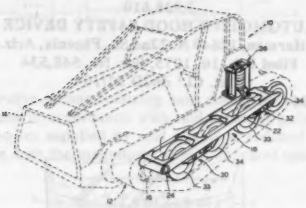
control means for steplessly increasing the transmission ratio of said transmission from a minimum speed to a maximum speed while holding said primary brake closed on the respective part of said primary assembly and for thereafter decreasing said transmission ratio and releasing said primary brake and selectively closing either of said turn brakes on the respective part.

3,938,605

TRACK SUSPENSION

Stanislaus H. Koch, London, Canada, assignor to Clark Equipment Company, Buchanan, Mich.

Filed June 24, 1974, Ser. No. 482,408
Int. Cl.² B62D *55/10*
U.S. Cl. 180—9.5 **7 Claims**



1. A track-laying vehicle comprising
a frame,
a pair of endless tracks, one on each side,
a pair of drive sprockets rotatably supported on the frame, one on each side, drivingly engaging the tracks at the front of the track loop,
a plurality of bogie wheels rotatably engageable with the lower portion of each track,
a pair of elongated main suspension beams each independently pivoted at opposite ends of an axis rearward of the axis of said drive sprockets and forward of the bogie wheels,
a suspension for said bogie wheels on each suspension beam including a truck frame providing a journal intermediate adjacent pairs of bogie wheels,
a bogie wheel suspension beam pivoted on said journal having fore and aft extending arms supporting a bogie wheel at each end thereof, and
a pair of spring units extending between the vehicle frame and the suspension beams adjacent the rear ends thereof each having a vertical axis of deflection for independently absorbing oscillations of each suspension beam.

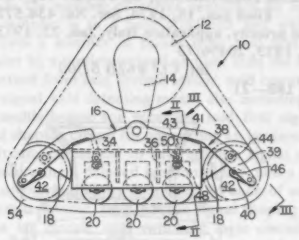
3,938,606

TRACK-IDLER RECOIL SUSPENSION MECHANISM

John W. Yancey, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 4, 1974, Ser. No. 520,459
Int. Cl.² B62D *55/12*
U.S. Cl. 180—9.5 **11 Claims**

1. In a vehicle having frame means, a rotatable member, a crank member pivotally mounted to said frame means, a link member pivotally mounted to said crank member, and to which the rotatable member is rotatably mounted, said link member being positioned relative to the vehicle to allow a degree of upward and downward motion of the rotatable member through pivotal movement of the link member relative to the crank member, wherein one portion of the crank member extends on one side of the crank member-frame means pivot axis beyond the axis of rotation of the rotatable member, and the link member is pivotally mounted to said one portion of the crank member beyond the axis of rotation of the rotatable member in said extended direction, and comprising track means in contact with a portion of the rotatable member, the link member having its longitudinal axis aligned generally parallel with a resultant force placed on the rotatable member by said track means.

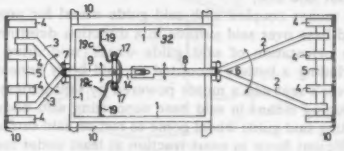


3,938,607

VEHICLE STEERING APPARATUS

Jorma Toivo Tapani Pohjola, Vaskitie 8, 90250 Oulu 25, Finland

Filed Jan. 23, 1974, Ser. No. 435,750
Claims priority, application Finland, Jan. 26, 1973, 231/73
Int. Cl.² B62D *11/20*
U.S. Cl. 180—9.44 **3 Claims**



1. In a vehicle, endless track means, front and rear roll means around which front and rear ends of said endless track means are respectively guided, front support means supporting said front roll means for swivelling movement about a substantially upright axis, turning means operatively connected with said front support means for turning the latter about said axis for steering the vehicle at least in a turning range having turning radii substantially larger than a given minimum radius of turning of the vehicle, transmission means operatively connected to said rear roll means for automatically limiting turning thereof at least during turning of said front support means in said turning range to a degree which is substantially less than the degree of turning of said front support means, said transmission means including a rear support means supporting said rear roll means for swivelling movement about a substantially upright axis situated to the rear of the swivelling axis of the front roll means, and said transmission means also including structure connected between said front and rear support means for transmitting turning to said rear support means and said rear roll means therewith only after said front support means and said front roll means therewith have turned through a given angle, said transmission means including a front roller and a pair of rear rollers respectively situated at the corners of a triangle, said front support means being formed with a slot receiving said front roller for transmitting turning of said front support means to said transmission means, the latter being swingably connected to said rear support means at a point between said pair of rear rollers, and guide means guiding said rear rollers for turning along a circle whose center is in said point during turning of said front support means within said given angle, and for then guiding said rear rollers for movement transversely of the vehicle for laterally shifting said point to swing said rear support means after said front support means has turned through said given angle.

3,938,608

WHEELED VEHICLE ADAPTED TO TURN ON THE SPOT

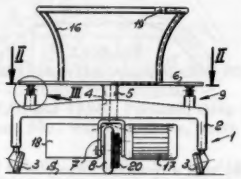
Gian Matteo Folco-Zambelli, Ca Chioare 13, Vicenza, Italy

Filed Jan. 18, 1974, Ser. No. 434,571

Claims priority, application Italy, Jan. 23, 1973, 19491/73; Jan. 23, 1973, 20496/73

Int. Cl.² B62D *61/00*

U.S. Cl. 180—21 **12 Claims**



1. A vehicle comprising:

a load-carrying body forming a driver's seat;

a base provided with at least three swivelable support wheels angularly spaced about a vertical axis, said body having a shaft in line with said axis journaled in said base;

a central guide wheel mounted on the lower end of said shaft for rotation in a vertical plane having an invariable orientation with reference to said body;

steering means for rotating said body relatively to said base about said axis;

drive means coupled with said guide wheel for propelling said base over said surface in a direction determined by the orientation of said guide wheel, said drive means including a battery mounted on said body beneath said driver's seat and a motor powered by said battery; and

cushioning means in said base supporting said body while letting said guide wheel come to rest on said surface with sufficient force to exert traction at least under load.

3,938,609

TRICYCLE

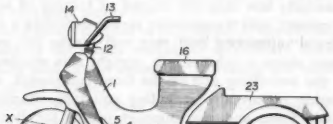
Yano Kensaku, Kawanishi; Kurose Makoto, Toyonaka, and Nagamitsu Toshiaki, Ikeda, all of Japan, assignors to Daihatsu Motor Company Limited, Osaka, Japan

Filed Jan. 17, 1975, Ser. No. 541,940

Claims priority, application Japan, Jan. 28, 1974, 49-12111; July 15, 1974, 49-81505

Int. Cl.² B60G *9/02*, *11/60*

U.S. Cl. 180—27 **19 Claims**



1. A tricycle having one front wheel and two rear wheels, comprising,

a. a front frame which is supported with said front wheel, said front frame having an operating handle for the front wheel and a seat for a rider,

b. a rear frame which is supported with said two rear wheels, said rear frame being provided with a driving equipment for driving at least one of said rear wheels,

c. connecting means for swingingly movably connecting said front frame and said rear frame with each other, said connecting means being directed in the axis line extending longitudinally of a tricycle body comprising said front frame and said rear frame,

d. an elastic member insertibly mounted to be supported between said front frame and said rear frame, said elastic member serving to restore the front frame from being leaned with respect to the rear frame, and

e. a first and a second supporting means for supporting both ends of said elastic member to said front and rear frame respectively, said first supporting means fixing one end of said elastic member to one of said front and rear frame, said second supporting means allowing the other end of said elastic member to be movable relatively to the other frame in a given range, said elastic member being substantially not elastically distorted within the given range but elastically distorted over the same range.

3,938,610

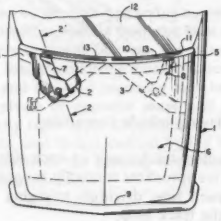
AUTOMOTIVE HOOD SAFETY DEVICE

Eugene V. Harman, 12649 N. 22nd St., Phoenix, Ariz. 85022

Filed Feb. 10, 1975, Ser. No. 548,534

Int. Cl.² B62D *25/10*

U.S. Cl. 180—69 C **6 Claims**



1. A safety device attachable to the frame of an automobile for preventing horizontal rearward movement of an automobile hood, said safety device comprising:

a. a base attachable to the frame of the automobile;

b. a retaining arm extending rearwardly of said base; and

c. a forwardly opening channel disposed at the rear of said retaining arm for slidably receiving the rear edge of the automobile hood when the hood is in the closed position, said channel including a further base and a lip and having the spacing intermediate said further base and said lip varying non-linearly from one end of said channel to the other end of said channel.

3,938,611

INTAKE MANIFOLD VALVE THROTTLE CONTROL FOR SPIN CONTROL SYSTEM

Robert B. Bertolasi, Rockford, Ill., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Nov. 23, 1973, Ser. No. 418,557

Int. Cl.² B60K *31/00*

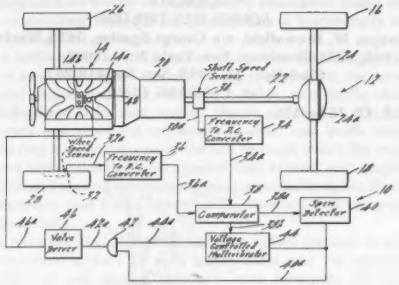
U.S. Cl. 180—77 R **17 Claims**

1. A spin control system for a multi-wheeled vehicle having one of the wheels thereof driven from a fuel-consuming engine having throttle valve means for supplying a fuel/air mixture and an intake manifold for communicating said fuel/air mixture to said engine in which a vacuum is produced when power is supplied by said engine to said one wheel for driving said one wheel, said system comprising:

sensing means for sensing an incipient wheel spin at said one wheel and for generating a spin signal comprising a series of pulses indicative of the magnitude of said incipient spin; and

valve means in addition to said throttle valve means communicating with said intake manifold and receiving said spin signal, said valve means being capable of venting the intake manifold of said engine in response to said spin

signal to sufficiently lower the intake manifold vacuum to thereby sufficiently reduce the power supplied by said engine to said one wheel to counteract an incipient spin,



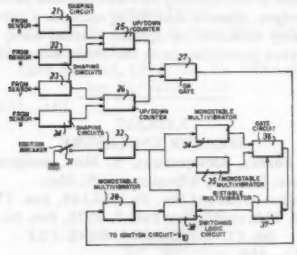
said valve means reducing said engine intake manifold vacuum in accordance with said series of pulses so that the power supplied by said engine is reduced in accordance with the magnitude of said incipient spin.

3,938,612

ANTI-SKID SYSTEM FOR THE DRIVING WHEELS OF AUTOMOTIVE VEHICLES

Jean-Claude Boudeville, and Jacques Gelin, both of Billancourt, France, assignors to Regie Nationale des Usines Renault and Automobiles Peugeot, both of, France

Filed Apr. 24, 1973, Ser. No. 353,936
Claims priority, application France, May 3, 1972, 72.15714
Int. Cl.² B60K *31/00*
U.S. Cl. 180—82 R **7 Claims**



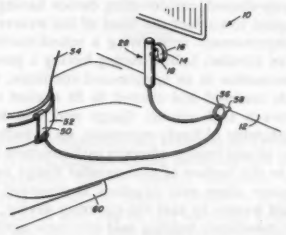
1. An anti-skid system for a motor vehicle having an ignition system, a driving wheel and a non-driving wheel, said anti-skid system protecting the driving wheel from skidding, said anti-skid system comprising a first sensor for generating a number of pulses proportional to the peripheral distance traveled by the driving wheel, a second sensor for generating a number of pulses proportional to the peripheral distance traveled by the non-driving wheel, the second sensor generating a higher number of pulses than the first sensor for the same peripheral distance traveled by the respective driving and non-driving wheels, and a calculating unit means, responsive to the signals generated by said first and second sensors, for detecting the difference in peripheral distance traveled by the driving and non-driving wheels independently of time, said detecting means including means for producing a delay in the ignition system when said difference in peripheral distance traveled is greater than a predetermined value to adjust engine torque and to maintain optimum road adherence of the wheels and wherein said detecting means includes means for constantly comparing the pulses generated by the first sensor and the pulses generated by the second sensor, said comparing means including a counter connected to said first and second sensors wherein when the number of pulses generated by said second sensor exceeds the number of pulses generated by said first sensor, said counter is in a zero condition and when said counter receives a number of pulses from said first sensor which is greater by a predetermined amount than the number of pulses received from said second sensor, said counter generates a first signal, said detecting means also including a first monostable multivibrator for receiving said first signal, an ignition signal shaping circuit for generating an ignition signal, a time lag circuit, connected to said ignition signal shaping circuit, for generating a delayed ignition signal, and a switching logic circuit having inputs connected to each of said first monostable multivibrator, said ignition signal shaping circuit and said time lag circuit, said switching logic circuit being controlled by said delayed ignition signal when said first signal is applied to said first monostable multivibrator.

3,938,613

MOTOR KILL SWITCH WITH OPERATOR ATTACHED TETHER

Eldridge W. Raborn, Sherman, Tex., assignor to Robert A. Gordon, Sherman, Tex.

Filed Oct. 1, 1974, Ser. No. 511,037
Int. Cl.² B60K *27/08*; H01H *27/06*
U.S. Cl. 180—99 **6 Claims**



1. In combination a vehicle having a dashboard panel of the type including an outer surface opposing a location on the vehicle to be occupied by the operator of the vehicle, an ignition switch mounted on said panel, said ignition switch being of the type including a lock barrel opening outwardly of said surface and oscillatable about a predetermined axis disposed generally normal to said surface, an elongated key including a blade end portion and an opposite end portion, said blade portion being removably insertable within said barrel to release the latter for oscillation between predetermined off and on positions thereof angularly displaced less than 180° relative to each other, an ignition switch cut-off safety device for angularly displacing the key and thus the barrel from its on position toward its off position, said safety device including an elongated body secured at one end to said opposite end portion of said key with said body extending transversely of the longitudinal extent of said key, a guide eye mounted on said panel in spaced relation relative to said switch, outwardly from said surface and on a path extending across said panel away from said switch in the direction in which the other end of said body extends when said lock barrel is in said off position, an elongated flexible tether member, first anchor means anchoring one end of said tether member to said other end of said body, second anchor means on the other end of said tether member for attachment to the operator of an associated vehicle, the midportion of said tether member being guidingly engaged through said guide eye for lengthwise shifting of said tether member relative to said guide eye, said first anchor means comprising an anchor member mounted on said one end of said tether member, said anchor member and said other end of said body including

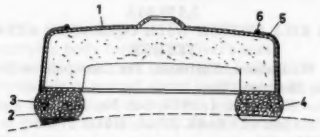
coacting means supporting said anchor means from said body for separation therefrom in response to a thrust in excess of a predetermined value being applied to said anchor member in a direction extending endwise outwardly of said other end of said body, said anchor member being of a size to pass freely through said guide eye.

3,938,614

CUSHION MEMBER FOR SOUND-PROOF SEALING

Inge Wilgot Ahs, Koppom, Sweden, assignor to Aktiebolaget Lennartsfors Mekaniska Verkstad, Lennartsfors, Arjang, Sweden

Filed June 20, 1973, Ser. No. 371,650
Claims priority, application Sweden, June 20, 1972, 8110/72
Int. Cl.² H04R 25/00, 1/10
U.S. Cl. 181—129 10 Claims



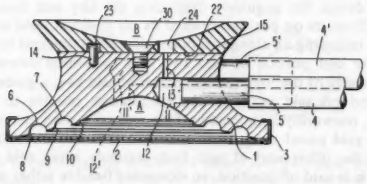
1. In a cup-shaped, ear-covering device having an annular flange adapted to contact the head of the wearer around the ear, the improvement comprising a sound-barrier structure including an annular, hollow casing having a generally-cylindrical cross-section in an unsqueezed condition, formed of a soft, pliable material and shaped to fit against said annular flange between said annular flange and said head of said wearer, a plurality of freely-moveable, small balls disposed in the interior of said casing, whereby said structure deforms and conforms to the surface of said annular flange and said head of said wearer when said structure is squeezed against said head of said wearer by said ear-covering device, and holding means for detachably holding said structure against said ear-covering device.

3,938,615

STETHOSCOPE CONSISTING OF A STETHOSCOPE CHEST PIECE AND A SOUND MIXER

Jacob Bodenger, 3564 Chimney Swift Drive, Huntingdon Valley, Pa. 19006

Filed July 11, 1974, Ser. No. 487,590
Int. Cl.² A61B 7/02
U.S. Cl. 181—131 15 Claims



1. An improved stethoscope chest piece having two cavities therein, each of said cavities forming respectively a first and second sound chamber in said chest piece, a first one of said two sound chambers having a flat, substantially rigid diaphragm disposed in a planar relationship with said first sound chamber so as to form a closed sound chamber, said chest piece further having means for providing for both optionally selectable acoustic insulation of said second sound chamber from said first sound chamber and optionally selectable acoustic communication of said first and second chambers.

3,938,616

SOUND MULTIPLIER

Swayze W. Brownfield, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Nov. 27, 1973, Ser. No. 419,267
Int. Cl.² G10K 11/10
U.S. Cl. 181—136 1 Claim

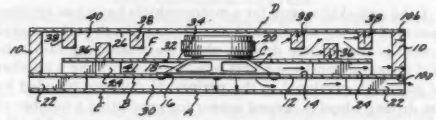
1. A sound amplifier comprising a pair of similar cups adapted to fit over a persons ears, in combination with a fitting adapted to be mounted on a persons head wherein each cup comprises a flat flange of spiral contour adapted to fit sealingly about a persons ear, wherein said flange has an upper end and a spaced lower end connected with an intermediate portion of spiral contour, including an integral outer shell of spiral contour extending outwardly from the flange having a transverse oval curvature providing an enclosure for the ear, said shell having an outer periphery terminating at the ends of the flange and a side opening between the said ends bounded by curved edges, wherein said fitting includes a curved member adjustably mounted on spaced vertical bars, including vertical sleeves projecting from the shells mounted movably on said bars.

3,938,617

SPEAKER ENCLOSURE

Lonnie R. Forbes, Albuquerque, N. Mex., assignor to Fort Enterprises, Limited, Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 434,188, Jan. 17, 1974, abandoned. This application Feb. 7, 1975, Ser. No. 546,315
Int. Cl.³ G10K 13/00; H04R 1/28
U.S. Cl. 181—155 7 Claims



1. A loud speaker acoustic enclosure sufficiently thin as to be supported from a vertical wall and concealed by a wall mounted picture disposed forwardly thereof, said acoustic enclosure including:

a. a multi-sided resonator frame having forward and rearward edges;

b. forward and rearward resonance boards bonded to said forward and rearward edges of said frame to cooperate with the latter to define an enclosed volume, said forward resonance board having a first aperture therein that is sized for mounting a large diameter end of an electrical speaker therein, said forward and rearward resonance boards each having forward and rearward surfaces;

c. a plurality of spaced first and second blocks secured to said forward and rearward surfaces of said forward resonance board adjacent said frame;

d. a cover board rigidly secured to said first blocks and disposed forwardly of said forward resonance board and cooperating with the latter to define a transversely extending first passage;

e. a baffle sheet of smaller transverse area than the interior of said frame that is transversely spaced from the latter and disposed in said enclosed volume, said baffle sheet supported from said second blocks parallel to said forward and rearward resonance boards, said baffle sheet having a second aperture therein through which the magnet end of the electrical speaker may extend, said magnet end and second aperture defining an annulus space therebetween said baffle sheet having forward and rearward surfaces;

f. a plurality of elongate spaced first baffles secured to said rearward surface of said baffle sheet and on opposite sides of said second aperture, with forwardly directed sound from said speaker travelling transversely through said first passage to emanate radially from all sides thereof, and rearwardly directed sound from said speaker to said resonator frame both through a second transverse passage defined between said rearward surface of said forward resonance board and forward surface of said baffle sheet as well as through said annulus and a transverse labyrinth defined by said first baffles, said forward surface of said rear resonance board and said rearward surface of said baffle sheet, and rearwardly directed sound also traveling through said rearward resonance board to said wall to resonate the latter; and

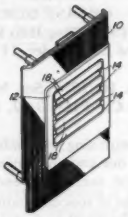
g. means for supporting said enclosure from said wall with said rearward resonance board in abutting contact with the latter.

3,938,618

SPEAKER GRILLE SCREEN AND MOUNTING STRUCTURE

Pasquale Ambruoso, Sr., Coral Springs, Fla., assignor to Motorola, Inc., Chicago, Ill.

Filed Mar. 18, 1975, Ser. No. 559,618
Int. Cl.² H05K *5/00*
U.S. Cl. 181—155 **12 Claims**



1. A protective structure for a sound translating device which provides sound transmission from the device, including in combination:

a plate of high strength material having an opening therein,

a rigid grille screen having a projection formed therein which is shaped to extend into said opening, said projection having an aperture therein adjacent an edge of said opening for the passage of sound, and

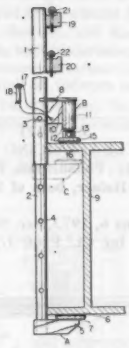
means securing said screen to said plate.

3,938,619

STANCHION

Kinji Kurabayashi, Kawasaki, and Tatsuo Ono, Tokyo, both of Japan, assignors to Nisso-Sangyo Co. Ltd., Japan

Filed Aug. 15, 1972, Ser. No. 280,765
Claims priority, application Japan, Nov. 12, 1971, 46-105765
Int. Cl.² E04H *17/14*; E04G *1/26*
U.S. Cl. 182—113 **1 Claim**



1. A stanchion construction for clamping to a scaffold plate, comprising vertical support means including first and second vertically extending tubular support members, means for fixing said first and second support members in an adjusted telescopic position with one of said members extending outwardly from the other of said members by a predetermined amount, clamping means carried by said first and second tubular support members including a threaded cylinder on said first tubular support member, a bolt threaded into said cylinder and having an outer end with a first flat engagement surface, a second flat clamping surface carried by said second tubular member and parallel to and opposed to said first clamping surface, said bolt being threadably adjustable to move said first clamping surface toward and away from said second clamping surface, said first tubular member having a hand rail and at least one fitting extending outwardly from said first tubular member and having means thereon for supporting said hand rail at a spaced location above said first clamping surface.

3,938,620

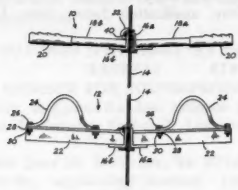
ROPE CLIMBER

Paul J. Nothiger, 2964 Hope, Klamath Falls, Oreg. 97601

Filed July 19, 1974, Ser. No. 490,137
Int. Cl.² A62B *1/06*
U.S. Cl. 182—135 **4 Claims**

1. A rope climbing device consisting of complementary pedal and handle units, each unit consisting of two connected, relatively rockable members, adapted to be manually rocked together to grip the rope and apart to release the rope, said members having confronting faces formed with interdigitally arranged, horizontally disposed, smoothly rounded projections cooperative to kink the rope sharply in opposite directions and thereby to bind it smoothly but firmly and dependably against slipping, the confronting portions of opposed rockable members being substantially coterminous at their upper ends, and one of them being equipped at its upper end

with spaced rope guiding devices which span the space between the confronting portions and serve also as stops for



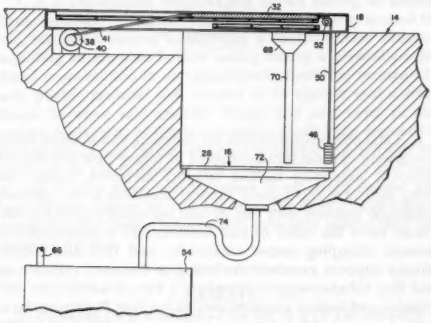
intercepting the other member, to limit rocking separation of such members.

3,938,621

VEHICLE SERVICING SYSTEM

William C. Bobbitt, Jr., Philadelphia, Pa., assignor to Rudolph Hafner and John Hafner, both of Southampton, Pa., part interest to each

Filed June 6, 1973, Ser. No. 367,454
Int. Cl.[2] F16C 3/14
U.S. Cl. 184—1.5 2 Claims



1. A vehicle servicing system comprising:

a. vehicle housing means having an upper level and a lower level, said lower level having a first floor member vertically displaced from and passing substantially parallel to a horizontal plane of said upper level, said first floor member being grated to permit passage of oil therethrough, said lower level further having a second floor member under said lower level first floor member adapted to transport said oil passing through said grated first floor member to a drain tank, said second floor member being inclined downwardly with respect to said first floor member, said second floor member being connected to said drain tank positioned below said second floor member at an area being substantially maximally displaced from said grated first floor member;

b. means for positioning at least one vehicle in a predetermined location within said upper level of said vehicle housing means;

c. removeable door means between said upper and lower levels of said vehicle housing means, said door means being located under said vehicle when said vehicle is in said predetermined location, said door means being removeable from under said vehicle responsive to an operator's control for servicing said vehicle from said lower level of said vehicle housing means;

d. means for draining oil from said vehicle within said vehicle housing means, said oil being drained from said vehicle to be collected in said drain tank through gravity assist; and,

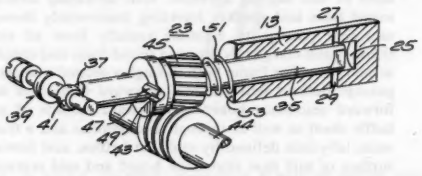
e. a moveable drain pan being positionally locatable under said vehicle, said drain pan being operatively connected to said drain tank to permit oil passage thereto through gravity assist, said moveable drain pan further including conduit means passing substantially in a vertical manner from said drain pan on one end to said grated floor member on a second end for transporting said oil from said vehicle through said conduit, said grated floor member and into said drain tank.

3,938,622

CHAIN SAW OIL PUMP WITH OVERLOAD PROTECTION

Ulrich O. Densow, Peterborough, Canada, assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 17, 1974, Ser. No. 515,668
Int. Cl.[2] F16N 7/36, 13/02, 25/02, 25/04
U.S. Cl. 184—15 R 13 Claims



1. A chain saw comprising a frame, an engine supported by said frame, wall means on said frame defining a pumping chamber including an inlet port and an outlet port, a pumping member rotatable in said pumping chamber relative to said inlet and outlet ports so as to effect pumping operation incident to such rotation, a shaft rotatably supported by said frame and driven by said engine and including thereon a first gear, a second gear meshed with said first gear for rotation thereof in response to first gear rotation and carried for rotary and axial movement relative to said pumping member, a projection radially extending from said pumping member, a notch formed on said second gear and adapted to releasably receive said projection so as to effect rotary driving of said pumping member by said second gear in response to engagement of said projection in said notch, and means in addition to said second gear and said projection yieldably biasing one of said second gear and said projection toward the other.

3,938,623

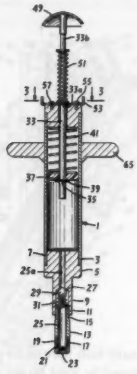
GREASE GUN

Richard C. Winston, 139 Rolling Hills Road, Thornwood, N.Y. 10594, and Leonard J. Vallender, 11 Clover Road, Valhalla, N.Y. 10595

Filed Jan. 16, 1975, Ser. No. 541,626
Int. Cl.[2] F16N 3/12, 13/08
U.S. Cl. 184—38 R 2 Claims

1. A grease gun comprising, in combination, a hollow cylindrical body closed at one end and having a removable delivery nozzle at the other end, said closed end having a central aperture, and a vent means in spaced relation therewith, a plunger means within said cylindrical body having a central aperture, a rod member slidable through said central aperture of said plunger means, said rod member having retaining means to prevent said plunger means sliding off of said rod, said rod member having a circumferentially recessed groove and an elongated detent portion in spaced relationship with each other, said rod member extending through said central aperture of said closed end of said cylindrical body and terminating exteriorly of said closed end, spring means around said rod member interiorly of said cylindrical body between said closed end and said plunger means adapted to force said plunger means towards said delivery nozzle, a central bore within said removable delivery nozzle, means within said central bore to be biased to permit the one way passage of grease from said

cylindrical body through said central bore, a lock slide member slidably secured to said closed end of said cylindrical body, said lock slide member having a central aperture for passage of said rod member with a laterally reduced extension adapted to engage with said circumferentially recessed groove



of said rod member when said rod member is withdrawn to said groove position, and with said elongated detent portion of said rod member when said rod member is in normal release position with the elongated detent portion controlling the stroke of said rod member.

3,938,624

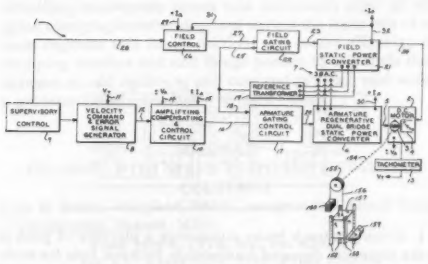
TRANSPORTATION SYSTEM WITH MOTOR FIELD CONTROL

John T. Maynard, New Berlin, Wis., assignor to Armor Elevator Company, Inc., Louisville, Ky.

Filed May 10, 1974, Ser. No. 468,864

Int. Cl.² H02P 5/16

U.S. Cl. 187—29 R **20 Claims**



1. A transportation system having a guide path structure and a plurality of spaced landings and transportation means comprising a transport vehicle, means mounting said vehicle for movement relative to said structure in a path extending adjacent each of said landings, motive means including a D.C. motor having a field circuit coupled to a source of polyphase energy and moving said vehicle relative to said structure, and control means controlling the amount of energy flowing between said source and said motive means including gated rectifying means connected to said source and to said field circuit and to gating control means, said gating control means including phase means having a first input circuit providng an alternating reference signal varying in response to said varying source energy and reference means having a second input circuit providing a constant reference signal and command means having a third input circuit selectively providing a field energy command signal in response to commanded vehicle movement and summing means including a common summing point connected to said first, second and third circuits and providng an output in response to the voltage and current summation of said alternating and constant reference signals and said command signal and operatively controlling the operation of said gated rectifying means and selectively supplying varying amounts of uni-directional energy to said field circuit.

3,938,625

VIBRATION DAMPING DEVICE, ESPECIALLY FOR PROTECTING PIPELINES FROM EARTHQUAKES

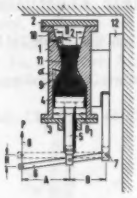
Gunter Radermacher, Rosrath, and Karl Alexander Busch, Bensberg-Herkenrath, both of Germany, assignors to Interatom, Internationale Atomreaktorbau GmbH, Bensberg, Cologne, Germany

Filed Mar. 14, 1974, Ser. No. 451,187

Claims priority, application Germany, Mar. 19, 1973, 2313483

Int. Cl.² F16F 9/30

U.S. Cl. 188—1 B **7 Claims**



1. Device for damping abrupt movements of equipment such as pipelines wherein vibrations caused by earthquakes or ship movements or the like are excited, while movements resulting from thermal expansion of parts of the equipment are not hindered, comprising a cylinder having a substantially vertical longitudinal axis, said cylinder comprising a lower cylindrical chamber and an upper chamber having an upwardly reducing cross section communicating with said lower cylindrical chamber, a piston displaceable in said lower cylindrical chamber, displaceable damping medium comprising a multiplicity of small, solid rollable bodies received in said cylinder above said piston, and means located below said lower cylindrical chamber for connecting said piston to the equipment, the abrupt movements of which are to be damped, said piston being displaceable upwardly in said lower cylindrical chamber against gravity force exerted by said rollable bodies, upon transmission of an abrupt movement from the equipment through said connecting means to said piston.

3,938,626

VIBRATION DAMPING ASSEMBLY

David Alan Hopkins, Detroit, Mich., assignor to The Valeron Corporation, Detroit, Mich.

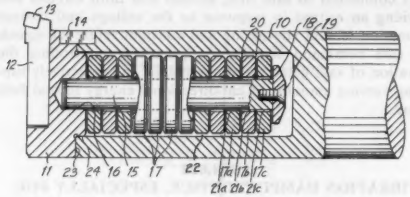
Filed Sept. 3, 1974, Ser. No. 502,365

Int. Cl.² F16F 7/10

U.S. Cl. 188—1 B **20 Claims**

1. Tool vibration damping means for a tool, such as a boring bar, having a longitudinal extension subject to cutting action induced vibration, characterized by a longitudinally extending internal reaction member with means for rigid cantilever mounting within and to said extension, and reactor means mounted on said member with transverse clearance relative thereto and greater transverse clearance relative to the sur-

rounding wall of said tool extension, whereby oscillatory vibration damping impact between said reactor means and said



reaction member will be imparted to and concentrated at said cantilever mounting.

3,938,627

MECHANICAL ENERGY ABSORBING DEVICE AND SAFETY HARNESS USING THE SAME

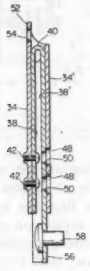
Yasuo Nagazumi, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Continuation of Ser. No. 323,262, Jan. 12, 1973. This application Jan. 24, 1975, Ser. No. 543,944

Claims priority, application Japan, Jan. 12, 1972, 47-6710[U]; Jan. 12, 1972, 47-6711[U]; Jan. 12, 1972, 47-6712[U]

Int. Cl.² F16F 7/12

U.S. Cl. 188—1 C **2 Claims**



1. In a safety harness, a mechanical energy absorbing device comprising an elongated casing having a rigid construction, said elongated casing having two spaced, substantially parallel inner surfaces which face with each other; and a deformable strip of substantially U-shaped form disposed between said two inner surfaces, said strip having one leg and other leg which is rigidly secured at an end portion thereof to the adjacent surface of one of said two inner surfaces; said mechanical energy absorbing device being connected to the safety harness so that a tension force is applied between said elongated casing and said one leg of said deformable strip, said one leg being formed at both sides thereof with guide flanges extending between said two surfaces.

3,938,628

DISC BRAKE ASSEMBLY

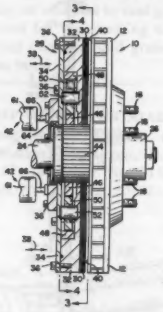
Antonio Casas Figueroa, Apartado 3210, San Jose, Costa Rica

Filed Dec. 12, 1974, Ser. No. 532,168

Int. Cl.² B60T 1/06; F16D 55/40

U.S. Cl. 188—18 A **4 Claims**

1. A disc brake assembly of the type primarily designed to brake a wheel assembly or like object, said brake assembly comprising: disc means connected to the wheel assembly, lining assembly including lining means disposed in engagable position relative to said disc means, lining support means disposed in interconnecting relation between said lining assembly and said disc means, said lining support means further comprising hub means, operative means connected to said lining assembly and positioned to movably dispose said lining means into and out of frictional engagement with said disc means, lining movement means rotatably interconnected between said lining assembly and said lining support means, said lining movement means comprising gear means including a



hub gear mounted on said hub means to rotate therewith, ring gear means fixedly secured to said lining means so as to rotate therewith, satelite gear means interconnected therebetween in an intermeshing engagement with both said ring gear means and said hub gear, whereby rotation of said hub gear causes rotation of said lining means in the direction opposite to that of said hub means and said connected disc means.

3,938,629

RAILWAY TRACK BRAKE

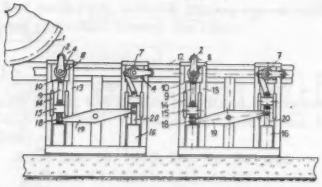
Leszek Marszalek; Tadeusz Lorenc, both of Rybnik, and Andrzej Hodbod, Katowice, all of Poland, assignors to Centralny Osrodek Badan i Rozwoju Techniki Kolejnictwa, Warsaw, Poland

Filed Aug. 8, 1974, Ser. No. 495,841

Claims priority, application Poland, Aug. 10, 1973, 164594

Int. Cl.² B61K 7/02

U.S. Cl. 188—62 **6 Claims**

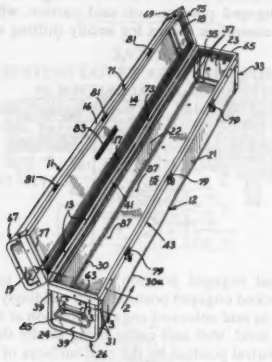


1. A railway track brake comprising a plurality of pairs of brake segments disposed transversely between rails for braking the wheels of a vehicle traveling on the rails, each segment comprising a rotatable top beam, a shaft rotatably supported by said top beam and having ends with projecting arms, contact means on said arms for being contacted by the wheels of the vehicle to be braked to cause rotation of said arms, means for producing rotation of said top beam in accordance with rotation of said arms, a displaceable bottom beam, means guidably supporting the bottom beam for linear displacement, a crank secured for rotation with said top beam, a connecting rod pivotably connected to said crank and to said bottom beam to displace the latter upon rotation of said crank, energy absorber means coupled to said bottom beam for resisting displacement thereof, and a double arm lever having ends pivotably interconnecting the bottom beams of each pair of brake segments so that said bottom beams move in opposite directions.

3,938,630
FABRICATED CASE

Joseph E. March, Chicago, Ill., assignor to Platt Luggage, Inc., Chicago, Ill.

Filed Feb. 6, 1975, Ser. No. 547,472
Int. Cl.² A45C *13/00*
U.S. Cl. 190—24 11 Claims



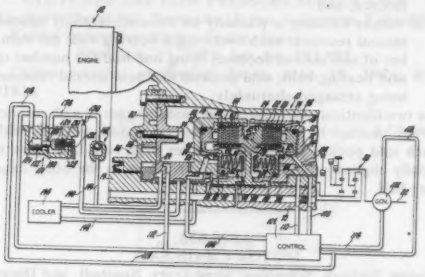
1. A case suitable for carrying relatively heavy objects, comprising, two opposed concave shells and means pivotally mounting said shells for movement between a closed position in which said shells enclose a volume to an open position in which the concavities of said shells are exposed, each of said shells including a back wall and four side walls, at least three of said walls in at least one of said shells being a single sheet of semi-rigid material bent to form the separate walls and defining at least two integral corners joining said walls, said sheet having a continuous edge lying in the planes of all of said walls formed thereby, a frame section means substantially coextensive with said continuous edge and having a channel portion and an integral flange portion extending therefrom, said flange portion being disposed against the outer sides of said walls at said continuous edge with said channel portion extending transversely across said continuous edge, an elongated clamping member disposed against the inner side of said walls opposite said flange portion, and means attaching said clamping member and said flange portion to said walls therebetween to add rigidity to said case and to retain said walls in a predetermined relationship to each other.

3,938,631
GEARING WITH SPEED RESPONSIVE STARTING CLUTCHES

Lyle B. Smith, Westland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 8, 1974, Ser. No. 486,525
Int. Cl.² F16H *3/74*, *5/36*; F16D *25/10*
U.S. Cl. 192—3.52 1 Claim

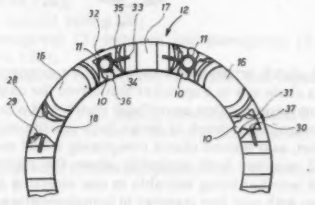
1. A drive arrangement for an engine driven vehicle comprising; an input shaft driven by the engine; fluid pump means driven by said input shaft for supplying fluid flow proportional to engine speed; forward and reverse fluid operated starting clutch means each having an input member driven by said input shaft and an output member; planetary gear means drivingly connected to said output members and being selectively operable for providing forward and reverse drive ratios for the vehicle, control means in fluid communication with said pump means for controlling the operation of said planetary gear means and said clutch means; control valve means and restriction means in fluid communication with said pump means for controlling the fluid pressure output of said pump means proportional to engine speed only when the vehicle speed is below a predetermined value, said restriction means being downstream of said control valve means; and vehicle speed signal means for supplying a pressure signal proportional to vehicle speed for operating said control valve means in response to vehicle speed only to discontinue fluid communication between said pump means and said restriction means.



3,938,632
OVERRUNNING CLUTCH

Emil Giese, and Ruprecht Maurer, both of Bad Homburg vor der Hohe, Germany, assignors to Ringspann Albrecht Maurer K. G., Bad Homburg vor der Hohe, Germany

Filed Jan. 22, 1975, Ser. No. 542,892
Claims priority, application Germany, Jan. 23, 1974, 24030715
Int. Cl.² F16D *41/07*
U.S. Cl. 192—41 A 13 Claims



1. In a combination of a sprag clutch with a deep-groove ball bearing having inner and outer races having circumferential grooves and axial shoulders defining a raceway; a plurality of bearing balls disposed in the raceway in alignment with the common central radial plane of the races; a plurality of sprags disposed in pairs in the raceway, the sprags of each sprag pair being situated axially adjacent on one and the other side of the raceway occupied by the bearing balls; the bearing balls and the sprag pairs being arranged alterantely in the circumferential direction; spring means for urging each sprag into coupling engagement with the race shoulders; and a cage ring disposed in the raceway for supporting the balls and the sprags and maintaining a spacing therebetween; the improvement comprising two identical radial cage ring halves abutting one another in and along the zone of said radial running plane to constitute said cage ring; each cage ring half having:

a. a continuous circumferential terminal wall disposed spaced from the abutting faces of the two cage ring halves, said terminal wall having an outer face constituting the outer radial edge face of said cage ring half;
b. means defining a plurality of circumferentially spaced first recesses, each receiving and pivotally supporting a sprag and its associated spring means;
c. means defining a plurality of circumferentially spaced pockets, each receiving a bearing ball; the number of said pockets being one half the number of said bearing balls;

each pocket being formed as a jaw surrounding the associated bearing ball over more than one half of its circumference; and

d. means defining a plurality of circumferentially spaced second recesses, each receiving a bearing ball; the number of said second recesses being one half the number of said bearing balls; said pockets and said second recesses being arranged alternately;

the two identical cage ring halves being staggered with respect to one another by the extent of one ball pitch, whereby with each said pocket provided on either cage ring half there is axially aligned one of said second recesses in the other cage ring half.

3,938,633

MOTOR CHAIN SAW

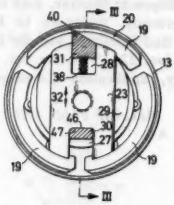
Gunter Dietzsch, Schmiden; Gerd Frers, Neustadt, and Dieter Wieland, Neckarrems, all of Germany, assignors to Andreas Stihl Maschinenfabrik, Germany

Filed Feb. 14, 1973, Ser. No. 332,259

Claims priority, application Germany, Feb. 2, 1972, 2207088; May 13, 1972, 2223472

Int. Cl.² F16D *47/00*

U.S. Cl. 192—48.3 **29 Claims**



1. A clutch arrangement especially for connecting the motor of a chain saw to a sprocket that drives the chain of the saw and comprising: a first centrifugal clutch and a second manually controllable clutch in series between the motor and the sprocket, said second clutch comprising a first member and a second member both rotatable about the clutch axis, said second member being movable in one direction into engaged position with said first member in complementary relationship and in the other direction into disengaged position from said first member, said second member being subject to centrifugal force when said second clutch rotates, said centrifugal force in at least disengaged position of said second member urging said second member toward the respective position thereof, said first clutch comprising weight means which move radially outwardly to cause engagement of said first clutch, said weight means having radial slot means forming the said first member of said second clutch and said second member having tooth means engageable with said slot means in engaged position of said second member, cam element means operatively connected to said second member and adapted for engagement by abutment means interposed in the path of travel of said cam element means to move said second member in at least one of said directions during rotation of said second clutch.

3,938,634

CLUTCH MECHANISM

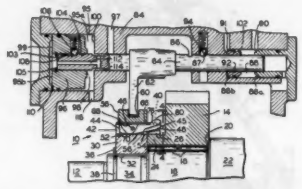
Barry L. Frost, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 22, 1975, Ser. No. 543,089

Int. Cl.² F16D *43/20*

U.S. Cl. 192—56 F **13 Claims**

1. In a clutch having a rotatable driving member and a rotatable driven member, a carrier fixed to one of said members, axial slots in the periphery of said carrier, rockers in said slots having normally self-disengaging clutching portions on at least the end adjacent to the other of said members, corresponding normally self-disengaging clutching portions on the adjacent end of the other of said members for receiving the clutching portions of said rockers, cam surfaces on said rockers, an axially shiftable collar on said carrier to engage said cam surfaces for rocking said rockers selectively into and out of engagement with said clutching portions of the other of said members, said axially shiftable collar having locked neutral and locked engaged positions on said carrier, wherein the improvement comprises means for axially shifting said collar



to an unlocked engaged position intermediate said locked neutral and locked engaged positions and yieldingly maintaining said collar in said unlocked engaged position at a predetermined torque level, with said collar being axially shifted back into locked neutral position by the cam surfaces of said rockers, as a result of the separation of the selfdisengaging clutching portions of both said rockers and the other of said members, when said predetermined torque level acting on said collar is exceeded by the torque transfer between said driving and driven members.

3,938,635

DRIVEN PLATES FOR FRICTION CLUTCHES

David Aubrey Davies, and Dennis Sydney Johnson, both of Leamington Spa, England, assignors to Automotive Products Co., Ltd., Leamington Spa, England

Filed Feb. 11, 1974, Ser. No. 441,622

Claims priority, application United Kingdom, Feb. 21, 1973, 8516/73

Int. Cl.² F16D *3/14*

U.S. Cl. 192—106.2 **15 Claims**

1. A clutch driven plate comprising an annular friction facing carrier mounted for limited rotational movement on a hub, two radially extending annular disc-like members, each annular disc-like member being fixed directly and non-rotatably to the hub, registering openings formed in said annular friction facing carrier and in said disc-like members, resiliently compressible members mounted in said registering openings to oppose said limited rotational movement, and a stop which is carried by one of said annular disc-like members and which projects into a circumferentially elongated slot in said annular friction facing carrier to limit rotational movement of said

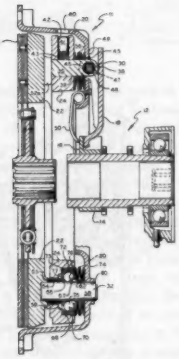
annular friction facing carrier relative to the hub, wherein the improvement comprises said stop being constituted by a bent-over tongue, which is integral with said one annular disc-like member, and locating means which are defined by the other annular disc-like member and which are engaged with a co-operating part of said tongue so as to co-act with the co-operating tongue part to resist circumferential deflection of said tongue relative to said one annular disc-like member.

3,938,636

SELF-ADJUSTING COVER ASSEMBLY FOR FRICTION CLUTCHES IMPROVEMENT

Karl Nerska, Seneca Falls, N.Y., assignor to Lipe-Rollway Corporation, Syracuse, N.Y.

Filed Mar. 13, 1974, Ser. No. 450,596
Int. Cl.² F16D *13/75*
U.S. Cl. 192—111 A 6 Claims



1. In a friction clutch for connecting driving and driven shafts, the clutch having a release lever actuated by a release mechanism, a friction disc, a clutch cover and a pressure plate; the improvement comprising a self-adjusting means associated with the release lever and the pressure plate, said self-adjusting means including:

a first connecting means operably connected to the release lever and having at least one facing surface, said connecting means including a secondary pressure plate, the facing surface in the connecting means being in an aperture in said secondary pressure plate;

a second connecting means secured to the pressure plate and having at least one facing surface, at least one facing surface of said first connecting means confronting at least one facing surface of the second connecting means;

the confronting facing surfaces being spaced from one another to define a cavity, said cavity having at least one inclined surface therein; and

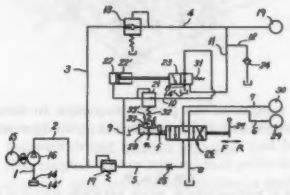
at least one jamming ball positioned in said cavity, said ball being dimensioned to roll when in one part of the cavity and to be bound between a part of said inclined surface and one of said confronting facing surfaces.

3,938,637

CONTROL SYSTEM FOR FORWARD-REVERSE CLUTCHES AND LOW PRESSURE SUPPLY LINE

Kiyoharu Murakami, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Feb. 21, 1975, Ser. No. 551,987
Claims priority, application Japan, Mar. 19, 1974, 49-31816
Int. Cl.² F16D *25/10*
U.S. Cl. 192—113 R 4 Claims



1. For use in a vehicle or a vessel having a fluid-actuated forward clutch and a rearward clutch, a source of fluid under pressure, and a forward-rearward select valve therebetween, the combination of single lever clutch control system for selectively controlling actuation of the clutch comprising:

a pressure preserve valve (17);

a first passageway (2) between said source of pressurized fluid and said valve (17);

a second passageway (5) between said valve (17) and said select valve (26);

a one-way control valve (18);

a third passageway (3) between said passageway (2) and said valve (18);

a fourth passageway (4) between valve (18) and lubricating parts (19);

an inching valve (21) the setting pressure of which is regulated in proportion to the extent of action of select valve (26);

a fifth passageway (9) between passageway (5) and inching valve (21);

a drain valve (23);

a sixth passageway (10) between inching valve (21) and drain valve (23); and

a seventh passageway (11) between drain valve (23) and said fourth passageway (4); said drain valve (23) being adapted to place said sixth passageway (10) in communication with said seventh passageway (11) when the fluid pressure in fifth passageway (9) increases beyond a predetermined value whereby inching valve (21) and select valve (26) are operated by a single select lever (27).

3,938,638

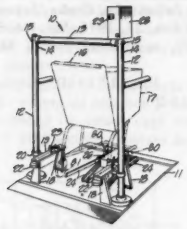
APPARATUS FOR RECEIVING AND ACKNOWLEDGING THE RETURN OF A VEHICLE AT A CHECK-IN STATION

Richard D. Moule, South Pasadena, Calif., assignor to Franklin Electric Subsidiaries, Inc., Bluffton, Ind.

Filed Dec. 17, 1973, Ser. No. 425,107
Int. Cl.² G07F *7/06*
U.S. Cl. 194—4 C 40 Claims

1. Apparatus for receiving and acknowledging the return of a wheel-supported vehicle at a check-in station, said apparatus having passageway means for accommodating a returning vehicle, a plurality of sensors adjacent said passageway means operable in preselected sequence in response to the movement of a returning vehicle therethrough in a predetermined direction, means responsive to the proper sequential operation of said sensors to acknowledge the return of a vehicle

through said passageway means, and said sensors including means effective to thwart efforts of unauthorized persons to



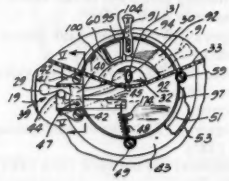
operate said sensors in the proper sequence to simulate the return of a vehicle and obtain a false acknowledgment thereof.

3,938,639

PORTABLE DISPENSER FOR MIXED BEVERAGES

Peter Leslie Birrell, Delta, Canada, assignor to The Cornelius Company, Minneapolis, Minn.

Filed Nov. 28, 1973, Ser. No. 419,872
Int. Cl.[2] G07F *13/00*
U.S. Cl. 194—87 **19 Claims**



13. A dispenser comprising:

dispensing means for supporting a supply of flowable material to be dispensed, and having movable metering means for selectively dispensing metered quantities of the material;

a manually movable operating device mounted on the dispenser adjacent to said dispensing means and adapted for normally free movement relative to the dispensing means;

means on said operating device and on said metering means for receiving and engaging a coin vertically on edge releasably therebetween as a coupling so that manual movement of the operating device effects material dispensing movement of the metering means; and

means for vertically adjusting the effective height of said coin receiving and engaging means to receive coins of a selected size for operating the dispenser.

3,938,640

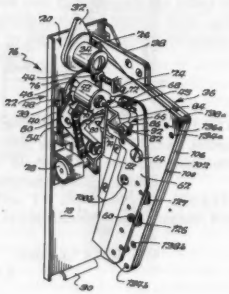
COIN OPERATED LOCK

Wells F. Stackhouse, Ashville, and Douglas A. Barth, Sinclairville, both of N.Y., assignors to American Locker Company, Inc., Jamestown, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,701
Int. Cl.[2] G07F *1/04*
U.S. Cl. 194—92 **2 Claims**

1. In a coin operated lock of the type having a coin chute formed with vertically spaced coin inlet and discharge ends and constraining coins to move on edge downwardly therethrough, an intercepting finger arranged relatively adjacent said discharge end for releasably retaining a coin deposited in said chute and a coin feeler arranged relatively adjacent said inlet end and being removably insertable into said chute for sensing the presence of a coin retained therein by said intercepting finger, characterized in that operation of said lock may be effected only upon sensing of the presence of a coin by said coin feeler whereafter the sensed coin is released by said intercepting finger for discharge through said discharge end, the improvement for permitting said lock to be operated by a proper grouping of coins consisting of two or more coins of a given denomination of a given currency successively deposited in said coin chute and setting edge on edge therewithin, which comprises:

said coin chute being vertically bounded by a downwardly facing guide surface and an upwardly facing coin edge supporting surface arranged essentially parallel to said guide surface and spaced therefrom through a distance corresponding essentially to the diameter of the coin of said given denomination while permitting free movement of said coin of said given denomination downwardly through said chute, said surfaces being inclined at an angle to the horizontal affording gravity feed of coins through said chute while preventing a second or subsequently deposited coin from moving away from supporting engagement with said supporting surface by rolling over a previously deposited coin in a direction towards the guide surface, said coin feeler being arranged immediately adjacent said guide surface, said supporting surface having a coin receiving recess opening therethrough in a facing relationship with said coin feeler, said intercepting finger cooperating with one of said guide and supporting surfaces to releasably retain a first deposited coin of said given denomination within said coin chute while permitting previously deposited coins of other denominations of said given currency having a diameter less than said diameter to freely pass downwardly through said discharge end, said intercepting finger being spaced from said coin feeler through a distance insuring the positioning of a portion of a last deposited coin of said proper grouping for sensing by said coin feeler, said coin receiving recess having a lower end thereof arranged immediately above a point along said supporting surface at which said last deposited coin would be unsupported by said supporting surface and move into said coin receiving recess and away from a position thereof in which it can be sensed by said coin feeler, characterized in that the positioning of said intercepting finger relative to said coin feeler and the presence of said coin receiving recess prevents sensing of any coin by said coin feeler when a second or subsequently deposited coin of said given currency includes a coin of a denomination other than said given denomination.



3,938,641

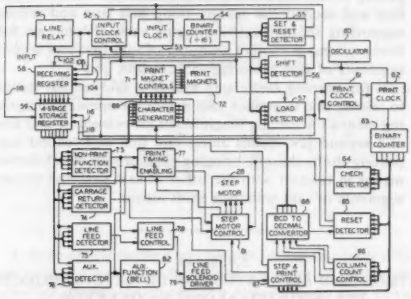
CONTROL SYSTEM FOR HIGH SPEED PRINTER

John R. Fulton, Brookfield, Ill., assignor to Extel Corporation, Northbrook, Ill.

Continuation-in-part of Ser. No. 349,438, April 9, 1973, abandoned, and a continuation of Ser. No. 528,447, Nov. 29, 1974. This application May 7, 1975, Ser. No. 575,370

Int. Cl.² B41J *25/00*

U.S. Cl. 197—1 R **13 Claims**



1. An electronic print rate control system for a high-speed column-sequential dot matrix printer actuated in accordance with a permutation code signal of given pulse rate in which each code word, representative of a character to be reproduced or of a non-print function, includes a given number of data pulses, the printer comprising a print head, print head drive means for stepping the print head through a plurality of column movements in each spacing character cycle, a print timing oscillator having an operating frequency *f* much higher than the pulse rate of said permutation code signal, a plural-stage FIFO storage register, each stage having a capacity sufficient to record a code word, means for recording each code word in the storage register, and means for reading out the code words from the storage register in the same order as received, the print rate control system comprising:

first countdown means, coupled to the print timing oscillator, for developing a normal print rate signal having a frequency *f/n;*

second countdown means, coupled to the print timing oscillator, for developing a fast print rate signal having a frequency *f/m*, where *n* and *m* are integers and $n>m$;

and print rate selection means for selectively applying one of the print rate signals to the print head drive means to control the rate of column movements, in each spacing character cycle, in accordance with the presence or absence of a code word recorded in a given stage of the storage register.

3,938,642

MAGNETIC KEY TOUCH CONTROL

Jaap Van Rumpt, Albertusstraat 16, Vught, and Joop A. Spermon, van Lennephof 57, Oss, both of Netherlands

Filed May 17, 1974, Ser. No. 470,980

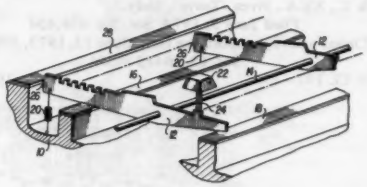
Int. Cl.²·B41J *5/08*

U.S. Cl. 197—98 **6 Claims**

1. In a keyboard having a key lever pivoted intermediate its ends, a bias means pivoting said key lever in one direction toward a home position, and a manually depressible key means for pivoting the key lever in the opposite direction away from said home position toward a limit position, the improvement comprising:

a first permanent magnet attached to said key lever at one end thereof whereby said magnet travels an arcuate path between first and second positions as said key lever moves between said home and limit positions; and,

a second permanent magnet disposed adjacent a point on said arcuate path that is between said first and second positions,



said magnets being poled such that the magnetic fields of said magnets create a force that aids said bias means as said first magnet moves toward said point from said first position, and opposes said bias means as said first magnet moves away from said point toward said second position.

3,938,643

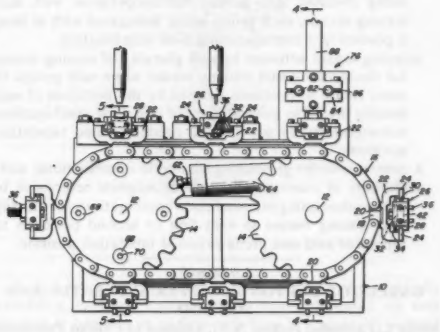
MECHANISM FOR FEEDING AND TRANSPORTING BRUSH BLANKS

Russell H. R. Parker, Cleveland, Ohio, assignor to Universe Machine Company, Inc., Cleveland, Ohio

Filed May 1, 1974, Ser. No. 466,071

Int. Cl.² B23Q *7/03*

U.S. Cl. 198—19 **18 Claims**

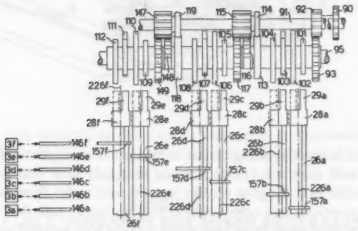


1. Brush blank handling apparatus comprising a transport unit for receiving and transporting brush blanks, and a plurality of work stations positioned adjacent the transport unit at spaced points therealong, said transport unit including a carrier mounted for travel along an endless path past said stations, indexing means for moving said carrier along said path in a stepped manner, a series of work holders, each work holder adapted to receive and mount a brush blank, mounting means mounting each holder to said carrier for sequential presentation at the work stations upon an indexing of said carrier, and transfer means at one or more of said stations, said transfer means being selectively engageable with an aligned work holder for a transfer to and subsequent return from the work stations, each work station having transfer means associated therewith including secondary work receiving holders mounted for movement in one or more directions independently of the transport unit, said secondary work receiving holders being adapted for transfer of brush blank holders from and subsequently to the transport unit.

3,938,644
HORIZONTAL TABULATION APPARATUS FOR ACCOUNTING MACHINES OR THE LIKE

Adriano Zambolin, Ivrea (Turin), and Gianfranco Defalco, Samone (Turin), both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed June 5, 1974, Ser. No. 476,434
Claims priority, application Italy, June 12, 1973, 25091/73
Int. Cl.² B41J *21/04*
U.S. Cl. 197—176 **10 Claims**



1. Horizontal tabulation apparatus for accounting machines or the like, having a frame, a platen and a carriage having relative motion with respect to said platen for reaching predetermined tabulation positions, comprising;

means for moving said carriage,

a plurality of sensing means movable from a first to a second of two positions for defining code combinations corresponding to the predetermined tabulation positions,

a first shaft fixed to said frame,

a plurality of cams rotatable on said first shaft, said rotation being actuated by said carriage moving means, said cams being divisible into groups for cooperation with said sensing means, each group being associated with at least a portion of a corresponding code combination,

stopping means actuated by said plurality of sensing means for deactivating said moving means when said groups of cams rotate to positions defined by the positions of said sensing means to generate one of said code combinations corresponding to one of said predetermined tabulation positions,

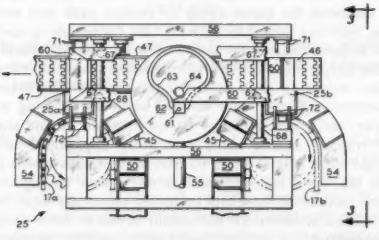
a control unit for generating said code combinations; and

a plurality of corresponding electromagnets responsive to said control unit generated code combinations for moving said sensing means to said first or second positions to represent said one predetermined tabulation position.

3,938,645
GABLE-TOP CARTON TRANSFER APPARATUS AND METHOD

Silvio T. Farfaglia, Fulton, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 7, 1973, Ser. No. 395,030
Int. Cl.² B65G *47/68*
U.S. Cl. 198—20 R **16 Claims**



1. Transfer means for moving a container from a first station to a second station, said transfer means comprising:

clamp means comprising first and second jaw means rotationally and longitudinally movable on respective first and second supporting shafts, each said jaw means having a cam follower means operably attached thereto,

means for moving said clamp means between said first and second stations,

an actuating shaft means having a smaller diameter first segment and a larger diameter second segment,

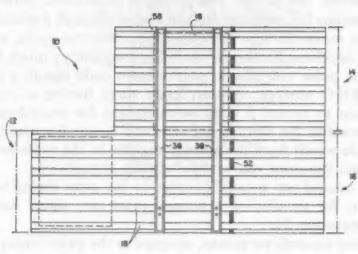
means for closing said clamp means at said first station to grasp the top of a container, said means for closing comprising means for forcing longitudinal movement of said first and second jaw means along said first and second supporting shafts thereby bringing each of said cam follower means in contact with one of said first and second segments of said actuating shaft means, and

means for opening said clamp means at said second station to release said container, said means for opening comprising means for forcing longitudinal movement of said first and second jaw means along said first and second supporting shafts thereby bringing each of said cam follower means in contact with the other of said first and second segments of said actuating shaft means.

3,938,646
METHOD AND APPARATUS FOR DEVIATING OBJECTS TRANSPORTED ALONG A CONVEYOR

Umberto Brasa, Uguccione da Pisa, N° 6, Milan, Italy

Filed Jan. 14, 1974, Ser. No. 432,861
Int. Cl.² B65G *47/26*
U.S. Cl. 198—31 R **7 Claims**



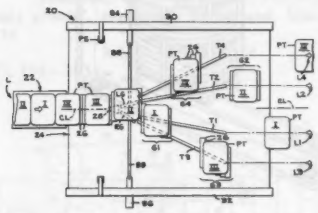
1. Apparatus for deviating the path of travel of sheet members traveling sequentially from a printing machine to a pair of side by side laterally arranged driers in a first direction along a conveyor reach traveling in the first direction and positioned between the printing machine and the driers; elongated means arranged transversely of said first direction for intercepting and stopping a first to arrive sheet member at a predetermined location along said first conveyor reach, a second conveyor reach generally coplanar with the first conveyor reach, said second conveyor reach traveling in a second direction transverse of said first direction and capable of being raised and lowered selectively to engage said first to arrive sheet member for displacing same from its stopped position to a transversely offset position along said first conveyor reach, said intercepting and stopping means being operable upon the next to arrive sheet member holding same against movement in the first direction while maintaining said displaced first to arrive sheet member against movement in said first direction and means for releasing said intercepting and stopping means to enable continued travel of said first to arrive and next to arrive sheet members side by side simultaneously in the first direction to the driers.

3,938,647

ARTICLE FEEDING SYSTEM

Glen F. Raque, Louisville, Ky., assignor to FMC Corporation, San Jose, Calif.

Filed July 16, 1973, Ser. No. 379,668
Int. Cl.² B65G 47/26
U.S. Cl. 198—31 AA 2 Claims



1. In an article feeding mechanism for continuously dividing one lane of articles into four lanes including an endless driven conveyor having an upper and lower reach, said conveyor comprising a series of laterally shiftable article carriers, each of said carriers having a single fixed switch pin, and guide means at the upper reach for engaging the carrier switch pins for diverting a single lane input of carriers on the upper reach into a multiple lane output of carriers, lower cam means at said lower reach for arranging the carriers into alternate separate groups so that when the carriers of one group reaches the upper reach its switch pins are laterally offset from the switch pins of the carriers of the following group, the switch pins of alternate groups thereby being disposed in separate lanes at the upstream end of said upper reach, said guide means at the upper reach comprising fixed upper cam means having an apex that is straddled by the pins of alternate groups, the pins of successive groups alternately engaging opposite sides of said fixed upper cam means to laterally shift the carriers of one group into one intermediate lane and to laterally shift the carriers of the following group into another intermediate lane, two diverging discharge lanes for each intermediate lane, a single movable gate for each of said intermediate lanes for diverting the carriers in each intermediate lane to one or the other of the associated discharge lanes; the improvement wherein said lower cam means is a fixed cam, means for sensing the presence of an article on each group of carriers at the inlet end of said upper reach, and control circuit means connected to said sensing means, said control circuit means comprises means for alternately actuating said gate means for said intermediate lanes, in response to the sensing of an article on alternate groups of said carriers by said sensing means.

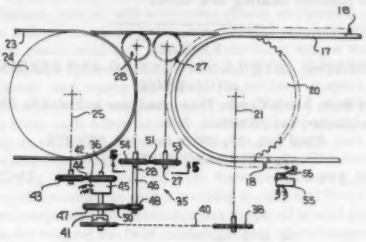
3,938,648

PACKAGE TRANSFER UNIT

Robert H. Ganz, 8 Ridge Crest Road, Saddle River, N.J. 07458

Filed June 21, 1974, Ser. No. 481,871
Int. Cl.² B65G 47/26
U.S. Cl. 198—34 14 Claims

1. An accelerating transfer unit for transferring articles from a first conveyor to a faster moving second conveyor, said accelerating transfer unit comprising a conveying member and drive means for selectively driving said conveying member at first and second surface speeds, said drive means including a first drive unit incorporating first drive element means for coupling to a first conveyor drive for the first conveyor to be driven at a first speed, overrunning clutch means between said first drive element means and said conveying member to drive said conveying member at a first speed, and a second drive unit incorporating second drive element means for coupling to a second conveyor drive for the second conveyor to be driven at a second speed, and selectively actuated clutch means for



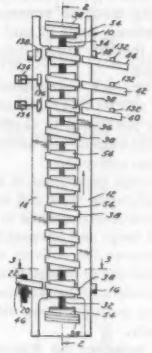
coupling said second drive element means to said conveying member in driving relation.

3,938,649

WORKPIECE ELEVATOR

William F. Bell, Mt. Clemens, and Walter H. Van Deberg, Berkley, both of Mich., assignors to F. Jos. Lamb Company, Warren, Mich.

Filed Nov. 29, 1974, Ser. No. 528,287
Int. Cl.² B65G 43/00
U.S. Cl. 198—38 16 Claims



1. In a workpiece elevator the combination of a vertically extending support, endless chain means mounted on said support to travel in an endless path lying in a generally vertical plane, a plurality of workpiece carriers mounted on said chain means at regularly spaced intervals, said carriers having a workpiece supporting surface inclined to the horizontal and having an inlet at the upper end and an outlet at the lower end of said supporting surface, a workpiece inlet chute adjacent the lower end of the support and a series of regularly spaced outlet chutes adjacent the upper end of the support, means for driving said chain means in said endless path with an intermittent motion so that the inlets of successive carriers are periodically aligned with said inlet chute to receive workpieces therefrom and the outlets of the successive carriers are periodically aligned with the successive outlet chutes, workpiece control means mounted on each carrier adjacent the outlet thereof, said control means being movable from a first position blocking said outlet to prevent discharge of workpieces from the carrier to a second position clearing said outlet to permit workpieces to be discharged from the carrier by gravity, retaining means for releasably locking said control means in said first position as the carriers travel between the successive outlet chutes, and release means on said support associated with each outlet chute for actuating said retaining means as

the carrier moves into alignment with an outlet chute to unlock said control means and cause the same to assume said second position clearing said outlet.

3,938,650

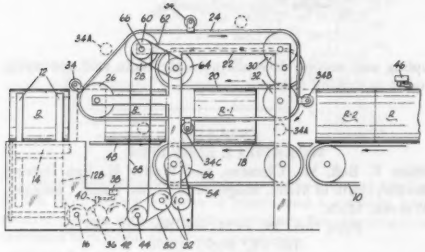
INDEXING ARTICLE SEPARATING AND FEEDING CONVEYOR

Ronald Holt, Battle Creek, Mich., assignor to Franklin Electric Subsidiaries, Inc., Bluffton, Ind.

Filed Feb. 27, 1975, Ser. No. 553,475

Int. Cl.² B65G *37/00, 15/16*

U.S. Cl. 198—76 **13 Claims**



1. In combination with a pair of side-by-side article delivery belts and a wrapping machine conveyor extending transversely across the delivery ends of said belts and in spaced relation to the ends thereof, article indexing and advancing mechanism comprising:

upper and lower opposed accelerator belts positioned to receive pairs of articles from said delivery belts,

a fixed dead plate positioned to support a pair of articles between the outlet ends of said accelerator belts and said wrapping machine conveyor,

a pair of carrier loops positioned in upright planes along side of said accelerating belts and said dead plate,

a plurality of transverse bars carried in equally spaced relation around said loops and advanced thereby into blocking positions between the delivery ends of said delivery belts and the receiving ends of said accelerator belts, and between said accelerator belts across said dead plate to article delivering position along side of said wrapping machine conveyor,

and drive means including an intermittent cycling drive connected to be driven from said wrapping machine conveyor and to concurrently drive said accelerator belts and said carrier loops at equal linear speeds greater than the speed of said delivery belts,

said intermittent cycling drive being arranged to provide a dwell and stop period with one of said cross bars in blocking relation in front of and closely adjacent the nip at the inlet ends of said accelerator belts.

3,938,651

SELF-SUPPORTING SPIRAL CONVEYOR

P. Allan Alfred, Hittarp; Sven-Olle H. Rothstein, Raa, and Stig Vilhelm Popoff, Landskrona, all of Sweden, assignors to Frigoscandia Contracting AB, Helsingborg, Sweden

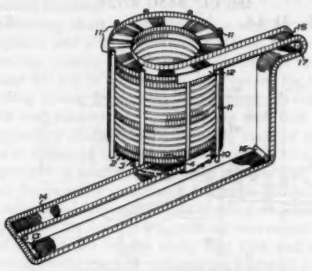
Filed Mar. 1, 1974, Ser. No. 447,375

Claims priority, application Sweden, Mar. 7, 1973, 7303179

Int. Cl.² B65G *15/00*

U.S. Cl. 198—136 **9 Claims**

1. A conveying device with an endless conveyor belt for the conveyance of products, in which device a portion of the length of said conveyor belt is arranged to follow a path consisting of a number of superimposed, helically extending tiers, said conveyor belt comprising mutually articulated and interadjustable link means and a bottom part and, disposed at the ends of said bottom part, said link means including links forming the two sides of the conveyor belt, wherein said links on either side of said endless conveyor belt are articulated and interadjustable and are formed as spacers whose upper edge portions are arranged to bear against lower transverse edge



portions of said links forming such spacers on either side of the overlying tier of said endless conveyor belt, in order that such an overlying belt tier be supported by the immediately underlying tier of said conveyor belt.

3,938,652

FEEDER RAKE WITH AN OVERLOAD PROTECTION DEVICE FOR AGRICULTURAL PICK-UP AND OTHER BALERS

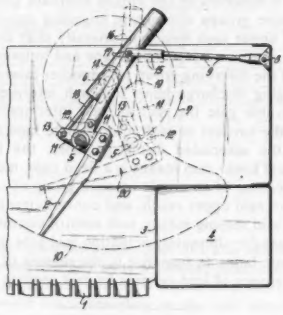
Hans Otto Sacht; Joost Honhold, and Uwe Elert, all of Wolfenbuttel, Germany, assignors to Gebrueder Welger, Wolfenbuettel, Germany

Filed May 22, 1974, Ser. No. 472,175

Claims priority, application Germany, May 28, 1973, 2327166

Int. Cl.² B65G *25/08*

U.S. Cl. 198—223 **8 Claims**



1. In a feeder rake device for an agricultural pickup and other balers mobile and stationary, a carrier of tines, crank means mounting said carrier for rotation about a fixed first axis, and for pivoting about a second axis radially offset from said first axis, tines having one end fixed to said carrier and pivotable therewith about said second axis, between a first and material-moving position and a second position ineffective to move material, link means connected to said carrier, fluid pressure means connected to said link means for urging said tines into said first position, movement of said tines to said second position increasing the pressure in said fluid pressure means, said fluid pressure means comprising a cylinder and a piston reciprocable therein, said link means comprising a piston rod fixed at one end to said piston and at its other end pivoted to said carrier, said link means also comprising a lever pivoted at one end on a third axis fixed with and offset from said first axis, and at its other end to a trunnion on said cylin-

der, and a link pivoted at its end on said trunnion and said carrier, respectively.

3,938,653

APPARATUS FOR CONVEYING AND TURNING ARTICLES

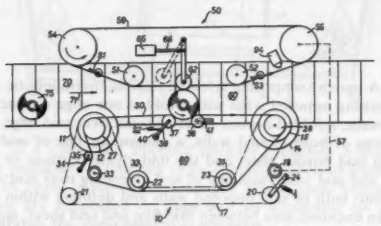
Edmund Senger, Buttwil, Switzerland, assignor to Emhart Zurich S.A., Zurich, Switzerland

Filed Mar. 10, 1975, Ser. No. 556,993

Claims priority, application Switzerland, Mar. 11, 1974, 3344/74

Int. Cl.² B65G *47/24*

U.S. Cl. 198—283 **6 Claims**



1. Apparatus for conveying articles proceeding on a line conveying device to a testing station and for rotating the articles at the testing station, comprising:

a conveyor belt disposed laterally of the line conveying device;

means for driving said conveyor belt;

a through belt disposed laterally of the line conveying device and spaced from said conveyor belt and cooperating therewith to define a track for conveying the articles at spaced intervals from one another to the testing station;

means for driving said through belt;

a control roller disposed on one side of said track, said control roller being displaceable between an operating position in which a portion of its periphery extends over said through belt and into said track, and a rest position in which its periphery lies outside said track;

a first pressing roller disposed adjacent the side of said track opposite that of said control roller, said first pressing roller being pivotable transversely with respect to said track; and

a second pressing roller disposed adjacent the side of said track opposite that of said control roller and downstream of said first pressing roller, said second pressing roller being rotatably disposed on a fixed shaft, said control roller and said first and second pressing rollers cooperating to interrupt the passage of articles proceeding through said track and to rotate each article at least one about the axis of the article at the testing station.

3,938,654

METHOD AND MACHINE FOR CONVEYING AND ALIGNING ROD-SHAPED FASTENERS

Johannes Mohr, Oberboihingen, Germany, assignor to Karl M. Reich Maschinenfabrik, Nuertingen, Germany

Filed Mar. 27, 1972, Ser. No. 238,635

Claims priority, application Germany, Apr. 2, 1971, 2116269

Int. Cl.² B65G *47/14*

U.S. Cl. 198—287 **8 Claims**

1. A machine for conveying rod-shaped fasteners from a supply of unaligned fasteners into alignment in at least one row behind each other and to at least one fastener treating mechanism having a certain working output, comprising, in combination, (a) means for guiding said fasteners from said supply to said fastener treating mechanism; (b) a plurality of successive fastener conveying means operatively associated with said guide means and each having a conveying output at least equal to said working output of said fastener treating mechanism, one of said conveying means comprising a conveyor belt of a non-magnetizable material movable within a vertical plane, said belt having a conveying strand movable upwardly and further having a conveying side and a rear side, and lower and upper uniformly magnetized magnet poles mounted in fixed positions at said rear side and separated by a gap from each other, another one of said conveying means having an outlet for delivering fasteners to a lower part of the conveying side of said belt underneath said gap, first means for controlling the quantity of said fasteners adhering to and conveyed upwardly by said conveying strand, said first control means comprising an electromagnet mounted in said gap, and means for varying the field intensity of said electromagnet and for thus determining the thickness of the layer of fasteners conveyed by said conveying strand upwardly beyond said electromagnet; (c) means for indicating on said guide means at the inlet side of a further one of said conveying means the accumulation of a certain quantity of fasteners coming from a preceding one of said conveying means in excess of the actual conveying output of said further conveying means; (d) second means responsive to said indicating means for controlling the operation of said preceding conveying means; and (e) return means actuated by said second control means for returning at least some of said accumulated fasteners to a position of said guide means at the rear of said preceding conveying means.

3,938,655

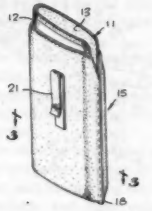
REMOVABLE STIFFENER FOR SPECTACLE CASES

Abraham Romolt, North Hollywood, Calif., assignor to Master Specialty Products, North Hollywood, Calif.

Filed Sept. 9, 1974, Ser. No. 504,132

Int. Cl.² A45C *11/04*

U.S. Cl. 206—5 **5 Claims**



1. A two-piece spectacle case comprising in combination:

an elongated tubular outer sheath of flexible material having one end thereof open to receive a pair of spectacles inserted axially into said sheath coaxially therewith; and

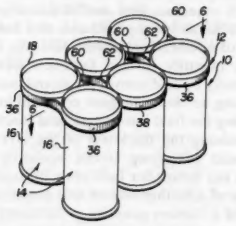
an elongated longitudinally rigid stiffener removably disposed within said sheath and defining a spectacle-receiving channel of generally U-shaped cross-section having opposed, spaced, resiliently connected front and rear walls, said stiffener being inserted slidingly into said sheath axially through said open end with the walls of said stiffener spaced apart a certain distance and exerting an outwardly directed force against said sheath to maintain said sheath in substantial conformity with the cross-sectional shape of said spectacles.

3,938,656

CONTAINER CARRIER AND METHOD OF MAKING SAME

Ronald Charles Owen, Harwood Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 2, 1974, Ser. No. 528,851
Int. Cl.² B65D 71/02, 63/10, 85/62; B26D 3/00
U.S. Cl. 206—150 9 Claims



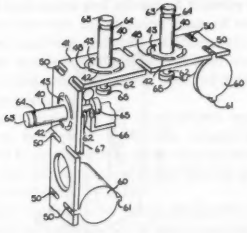
1. A carrier for a plurality of articles such as containers and the like comprising a set including a pair of adjacently disposed annular sections of flexible material each having an upstanding wall having a height greater than its thickness and upper and lower margins, said annular sections having an area of closest proximity to each other, and elements extending between said annular sections at opposite sides of said area and providing handle means for facilitating handling of the carrier.

3,938,657

BLIND RIVET ASSEMBLY

Melvin J. David, 16221 Quemada Road, Encino, Calif. 91316

Division of Ser. No. 307,119, Nov. 16, 1972. This application Apr. 26, 1974, Ser. No. 464,447
Int. Cl.² B65D 85/24
U.S. Cl. 206—343 5 Claims



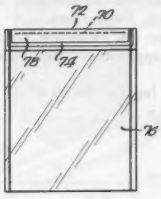
1. In a blind rivet assembly, a blind rivet carrier element comprising a malleable metallic strip having said plurality of rivet bodies uniformly disposed thereon, said rivet bodies comprising a preformed rivet head having a top and bottom surface coplanar with the top and bottom surfaces of said blind rivet carrier strip, said preformed rivet head being coupled to said carrier strip by breakable bridging elements therebetween, said preformed rivet head being depended into a cylindrical body having a uniform inner and outer diameter, said inner diameter being extended through said preformed rivet head and the end of said cylindrical body opposite said preformed rivet head being countersunk downwardly from the outer to the inner diameter thereof, said carrier element further including registration means for aligning said rivet bodies being disposed in opposition to one another along the transverse edges of said strip intermediate said rivet bodies and including perforation means for bending said carrier element interposed between said opposed registration means.

3,938,658

STERILE POUCH

William A. Rohde, Arlington Heights, Ill., assignor to Tower Products, Inc., Mundelein, Ill.

Filed Dec. 17, 1973, Ser. No. 425,306
Int. Cl.² A61D 19/02
U.S. Cl. 206—439 4 Claims



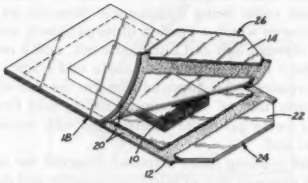
1. A pouch comprising a folded flexible thermoplastic film comprising opposed walls with a fold at one edge connecting said walls, a folded porous sheet engaged over said edge and portions of both of said walls, a continuous line of seal between said porous sheet and the underlying portions of said edge and said walls, said line of seal extending over said edge and into both of said opposed walls and defining within said line an enclosed area between said film and said sheet, and an opening in said film within said enclosed area, said opening being located in its entirety within said area and having its boundaries spaced inwardly from said line of seal.

3,938,659

FRANGIBLE BONDING USING BLUSH LACQUER AND PACKAGING BONDED THEREWITH

Charles R. Wardwell, 559 Oak St., Winnetka, Ill. 60093

Filed June 24, 1974, Ser. No. 482,436
Int. Cl.² B65D 75/60; B65B 55/10
U.S. Cl. 206—439 18 Claims



1. A package including a product enclosed by a substrate and a closure member, said substrate being bonded to said closure member by a frangible bonding system comprising a bonding agent in the form of a layer of dried blush lacquer formed of film-forming resin containing voids, the film-forming resin forming cohesive internal bonds of said layer of blush lacquer, said voids making said cohesive internal bonds of said layer of blush lacquer rupturable by peeling the closure member and the substrate from one another.

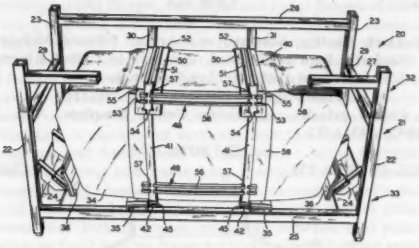
17. A methof of packaging a sterilized product between a substrate and a cover layer, said method comprising coating the substrate with a blush lacquer formed of a film-forming resin disposed in a liquid vehicle composed of a solvent and non-solvent for said resin, the solvent being more volatile than the non-solvent, evaporating said vehicle to leave the resin as a dried blush lacquer, the solvent being evaporated in preference to the non-solvent, applying a layer of heat seal material to said dried blush lacquer, placing the cover layer on the heat seal material with the product therebetween, applying heat and pressure to heat seal the cover layer to said dried blush lacquer to seal the product therebetween, and effectively sterilizing the enclosed space.

3,938,660

GLASS SHEET SHIPPING PACKAGES

Richard J. Moehring, Maumee, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed June 27, 1974, Ser. No. 483,701
Int. Cl.[2] B65D *85/48*
U.S. Cl. 206—451 11 Claims



1. In a composite shipping package including a shipping rack containing a plurality of up-standing sheets of glass having an open, substantially L-shaped frame upon which said sheets are supported on edge and an adjustable tie down apparatus, the improvement comprising

a. a pair of spaced apart L-shaped pads each having a first elongated leg lying transversely across the top edges of said sheets and a second leg lying along the front face of the outer one of said sheets;

b. a pair of banding straps wherein each of said straps is connected to one of said pads for holding said pad on said top edges of said sheets;

c. a first pressure member whose ends are connected to and extend between said straps and wherein the ends of the pressure member bear against said second leg of each said pad and,

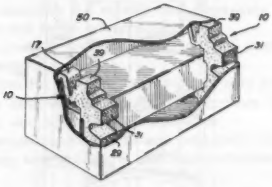
d. means securing said straps to said rack under tension for applying pressure on the ends of said pressure member whereby the pressure applied by each said strap to said pressure member is uniformly transmitted to said plurality of sheets to hold said sheets on said rack.

3,938,661

PACKING BRACE

John Maurice Carmody, Palos Heights, Ill., assignor to Republic Packaging Corporation, Chicago, Ill.

Filed Oct. 17, 1974, Ser. No. 515,566
Int. Cl.[2] B65D *81/04*, *85/30*
U.S. Cl. 206—523 5 Claims



1. A packing brace for packaging articles comprising, in combination,

an integral band of resilient material,

said integral band formed by a first section having a substantially U-shaped cross section and including both outer and inner bracing surfaces,

a second section having a substantially U-shaped cross section and including both outer and inner bracing surfaces,

a pair of integrally formed hinge members pivotally joined to and interconnecting said first and second sections between opposed legs of said U-shaped section,

each of said hinge members further including a centrally disposed hinge joint,

and said first and second sections and said hinge members being integrally formed as a unitary construction,

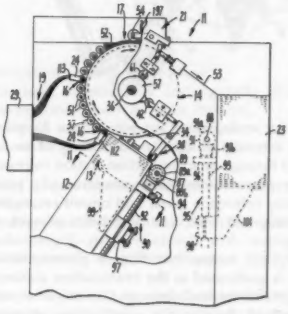
whereby each of said first and second sections may be moved laterally and arcuately throughout an arc of approximately 180° with respect to one another thereby to accommodate a variety of packaging positions.

3,938,662

SELECTIVE IMPRINTING MACHINE

Franklin Henry Ernst, Jr., 2500 Emerson St., Napa, Calif. 94558, and Dalny Travaglio, 299 Lexington Road, Kensington, Calif. 94707

Division of Ser. No. 364,010, May 25, 1973, Pat. No. 3,817,171, which is a continuation of Ser. No. 99,346, Dec. 18, 1970, abandoned. This application Dec. 3, 1973, Ser. No. 421,417
Int. Cl.[2] G06K *19/06*
U.S. Cl. 209—73 8 Claims



1. A device for selecting desired individual information-bearing media from a plurality of individual information-bearing media, comprising:

magazine means for holding a supply of individual information-bearing media,

a master indicia-bearing medium for selectively specifying the characteristics of the individual information-bearing media to be selected,

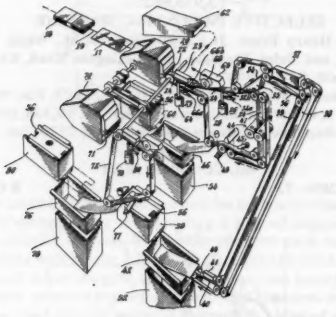
transport means for moving individual information-bearing media from said magazine means through scanning and selection stations, and for moving said individual information-bearing medium and said master indicia-bearing medium substantially continuously in joint synchronism with each other relative to said scanning means for simultaneous comparison of the two media thereby,

scanning means adjacent said scanning station and comprising a plurality of sensors, said scanning means being responsive to the characteristics of individual information-bearing media as compared with said master indicia-bearing medium to detect those individual information-bearing media having a first predetermined correspondence of said characteristics and issue a first signal upon such detection, and to issue a second signal upon detection of a second predetermined correspondence of said characteristics and upon default of detection of either of said first and second predetermined correspondence of said characteristics, and

selection means at said selection station responsive to said first and second signals to cause the desired information-bearing media to be selected out of the plurality of such media upon said first signal for further operations on such

desired media, and to reject media upon said second signal.

3,938,663
CIRCUIT FOR SORTING CURRENCY
W. Robert Carnes, Darien; John J. Balogh, Jr., Trumbull, and Lester L. Selnick, Ridgefield, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.
Filed Apr. 2, 1974, Ser. No. 457,368
Int. Cl.² G07D 7/00
U.S. Cl. 209—73 4 Claims



1. A circuit arrangement for providing a digital representation of the intensity of light transmissivity of an article being transported through an examination station over an interval of time, said representation being compared to a predetermined light intensity reference level, said circuit arrangement determining fitness and wear characteristics of said article, and comprising:

a first circuit means including a photosensitive element which is positioned at the examination station for receiving light transmitted through the article as said article is transported through the examination station, said first circuit means generating a first electrical signal having an amplitude which is proportional to the intensity of the light transmitted through said article;

a second circuit means coupled to said first circuit means for forming the integral of said first electrical signal, said second circuit means including gating means, said gating means receiving a gating signal from a bill present comparator for enabling and disabling, representively, the second circuit means, said gating signal being representative of the presence and absence, respectively, of an article at the examination station;

a bill present comparator operatively coupled to said gating means for generating and applying said gating signal to said gating means;

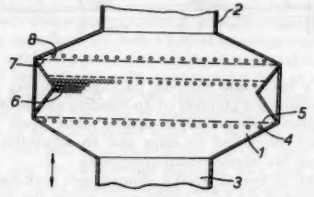
comparator circuit means having first and second input terminals, said comparator circuit means providing a first DC output level when an input signal applied to said first terminal is greater in amplitude than a reference signal applied to said second input terminal, and, for providing a second DC output level when the amplitude of a signal applied to said first imput terminal is less than the amplitude of a refernce signal applied to said second input terminal;

means for applying the integral of said first electrical signal to the first input terminal of said comparator circuit means;

means for establishing and applying to the second input terminal of said comparator circuit means a reference signal having an amplitude representative of a predetermined light intensity; and

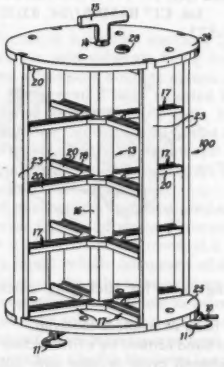
compensating circuit means disposed at said examination station and operatively connected to said comparator circuit means for detecting variations in the light intensity at the examination station in the absence of an article at said examination station, and for varying the reference potential applied to said second input terminal of said comparator circuit means in response to said variations in light intensity.

3,938,664
SIEVES
Kenneth Hartley, Seascale, and Arthur Edward McIntosh, Gosforth, both of England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed Aug. 23, 1973, Ser. No. 390,750
Claims priority, application United Kingdom, Aug. 23, 1972, 39316/72
Int. Cl.² B07B 1/00
U.S. Cl. 209—233 5 Claims



1. A sieve unit for separating spherical particles from undesirably shaped particles and debris, the unit comprising a bed of uniformly sized spheres disposed in efficiently packed layers in a substantially orthorhombic formation on a mesh screen, the spheres being of a size which packed efficiently provide an effective pore path of a diameter not greater than that of the mesh screen, and means for vibrating the spheres so as not to destroy the substantially orthorhombic formation.

3,938,665
DISPLAY UNITS
Clive St. John Rumble, 47 Orchard Court, Portman Square, London W. 1, England
Filed Dec. 13, 1973, Ser. No. 427,029
Claims priority, application United Kingdom, Dec. 18, 1972, 58321/72; Feb. 7, 1973, 6110/73; Sept. 7, 1973, 42215/73
Int. Cl.² E05B 73/00
U.S. Cl. 211—4 2 Claims



1. A pilfer resistant display unit for displaying cassettes while permitting inspection of the faces thereof, comprising a base including a vertically extending support rod, a pillar

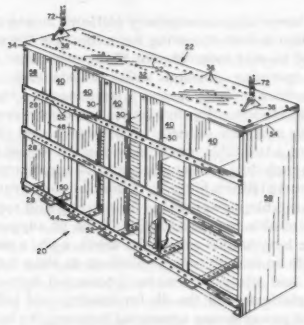
member having a vertically directed central aperture rotatably mounted on said support rod, a plurality of angularly spaced apart sets of support arms extending radially from said pillar, each of said sets of support arms comprising an upper arm and a lower arm, said arms being vertically spaced apart in accordance with the vertical extent of said cassettes, the upper arm of each set including radially extending depending parallel flanges, and the lower arm of each set including upwardly extending parallel flanges, the upper and lower flanges of each set being disposed in coplanar alignment to define a channel having an outwardly open mouth through which said cassettes may be slidably received and removed in a radial direction, said flanges prohibiting substantial non-radial movements of a cassette mounted within a said channel, a locking frame mounted on said pillar for rotation relative thereto about a vertical axis, a plurality of vertically directed blocking arms formed on said frame, said blocking arms being shiftable between blocking and unblocking positions of said mouth portions of said channels selectively in accordance with the rotated position of said locking frame relative to said pillar member, and locking means extending between said pillar member and said locking frame for locking said blocking arms of said frame in said blocking position and releasing said arms to permit relative rotation of said locking frame and pillar respectively in the locked and unlocked positions of said locking means.

3,938,666

RACK ASSEMBLY

William R. Castleberry, 409 Franklin, San Marcos, Tex. 78666

Filed Oct. 21, 1974, Ser. No. 516,651
Int. Cl.² A47F *5/10*
U.S. Cl. 211—49 D **13 Claims**



1. A rack assembly for storing and dispensing articles of varying width and depth comprising:

adjustable vertical walls forming vertical compartments therebetween;

bottom means for carrying the weight of said articles contained in said compartments, said bottom being connected to said adjustable vertical walls;

retaining means connected to said adjustable vertical wall for holding said articles in said compartments until dispensed;

top means for detachably connecting to the uppermost portion of said vertical walls;

depth adjustment means extending from said top means to said bottom means to maintain smaller articles at the front of said compartments until dispensed;

cooperating means on said top means, bottom means and said depth adjustment means to allow adjustments in depth of said vertical compartments without removing said depth adjustment means from within said rack assembly;

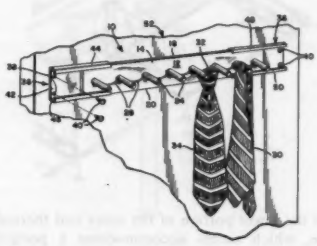
said articles feeding by gravity as an individual article in a compartment is removed through an opening in the bottom portion of said retaining means thereby allowing the remaining articles in that compartment to drop downward.

3,938,667

COMBINATION TIE RACK

Bonnie P. Buckland, 21 Lanyard Ave., Trotwood, Ohio 45426

Filed Sept. 19, 1974, Ser. No. 507,406
Int. Cl.² A47F *7/00*
U.S. Cl. 211—87 **2 Claims**



1. A combination tie rack comprising:

a. an elongated, substantially rectangularly shaped base plate having front and rear faces thereon,

b. a plurality of sockets formed in said base plate at said front face thereof at uniformly spaced intervals along said front face,

c. a plurality of posts having the bases thereof received in said sockets,

d. said posts projecting from said front face of said base plate substantially perpendicularly with respect thereto and thereby being shaped to support untied neckties thereon,

e. a plurality of discrete, semi-circular wire loops projecting outwardly perpendicularly from said front face of said base plate,

f. ends of each of said wire loops being received in adjacent sockets with said posts, thereby disposing said loops intermediate said posts,

g. said wire loops being adapted to be engaged by the hooks of pretied neckties to suspend pretied neckties therefrom and the spacing between said posts and said loops being such that all of said posts and said loops can be occupied simultaneously by untied and pretied neckties, respectively,

h. a pair of substantially C-shaped attaching brackets telescopically receiving opposite ends of said base plate,

i. said attaching brackets, at each end of said base plate, overlying said rear face and upper and lower edges of said base plate and portions of said front face adjacent said upper and lower edges, and

j. openings formed through said base plate to receive fasteners therethrough, thereby adapting said base plate for direct attachment to internal structural members of a vertical supporting surface.

3,938,668

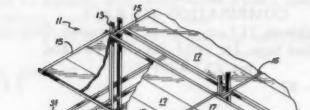
GUIDERAIL SYSTEM FOR STORAGE RACKS

Anthony N. Konstant, Mount Prospect, Ill., assignor to Speedrack Inc., Skokie, Ill.

Filed Feb. 21, 1974, Ser. No. 444,355
Int. Cl.² A47F *5/00*
U.S. Cl. 211—134 **3 Claims**

1. A cantilever storage rack having support means in contact with the floor including an elongated base extending substantially the full depth of said rack to a location adjacent

an aisle which provides access to the storage rack, a guiderail located along the aisle-defining edge of the storage rack and bracket means for holding said guiderail in desired position, said guiderail being tubular, and said bracket means including horizontally extending projections proportioned to closely interfit within said tubular guiderail, said base containing a



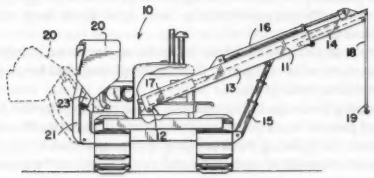
recess in the lower portion of the outer end thereof adjacent the aisle, which recess accommodates a portion of said bracket means so that the outermost extension of said base is in general vertical alignment with the outermost extension of said guiderail and the load carried by the storage rack is transferred to said bracket means.

3,938,669

HYDRAULIC CIRCUIT FOR A PIPELAYER

David S. Vinton, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 25, 1974, Ser. No. 454,107
Int. Cl.² B66C *23/00*
U.S. Cl. 212—8 B **20 Claims**



1. A hydraulic circuit for a pipelayer machine having an extensible boom pivotally mounted to a vehicle, an extensible hoist cable extending from the outer end of said boom, and a counterweight extending from one side of said vehicle to counterbalance said boom, said circuit comprising:

a boom lift motor operatively connected for lifting said boom;

a hoist motor operatively connected for extending and retracting said hoist cable;

a first source of pressurized fluid for supplying fluid by way of first circuit means for low speed operation of said motors;

first valve means for selectively communicating fluid from said first source of fluid to one of said motors;

a second source of pressurized fluid for supplying fluid by way of second circuit means for high speed operation of said motors;

second valve means for selectively communicating fluid from said second source to said one of said motors;

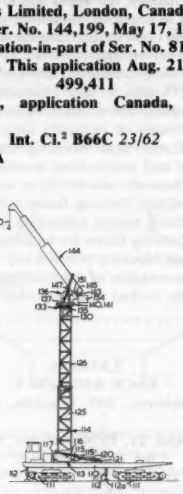
control means interconnecting said first and second valve means and operative over a first range of movement for moving said first valve means into communicating position and operative over a second range of movement for moving said first valve means to a non-communicating position and simultaneously therewith move said second valve means to a communicating position.

3,938,670

TOWER CRANE

Donald E. Wellman, Komoka, Canada, assignor to General Crane Industries Limited, London, Canada

Continuation of Ser. No. 144,199, May 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 818,751, April 23, 1969, abandoned. This application Aug. 21, 1974, Ser. No. 499,411
Claims priority, application Canada, Apr. 9, 1969, 48201/69
Int. Cl.² B66C *23/62*
U.S. Cl. 212—46 A **18 Claims**



10. A tower crane comprising platform means carrying in combination a base mounting for a tower, a tower pivotally connected to said mounting for tilting movement between a vertical operating position and a substantially horizontal stored position, raising means interconnecting the platform means and the tower for moving the tower between said positions, a jib structure carried by said tower, said jib structure comprising a turntable mounted on the top of said tower, said turntable including a rotatable part and a non-rotatable part, a jib support platform hingedly connected to the rotatable part of said turntable, power means for rotating said rotatable part of said turntable to cause slewing of the jib support platform about the longitudinal axis of the tower, a jib, a pivot mounting said jib on said jib support platform to allow luffing movement of said jib, power means connected between the jib support platform and the jib for causing said luffing movement, and power means connected between the movable part of said turntable and said jib support platform for folding the jib support platform relative to said turntable about said hinge connection, whereby the jib support platform and associated jib can be folded to an inoperative position along the side of the tower for storage and unfolded to an operative position to the top of said tower.

3,938,671

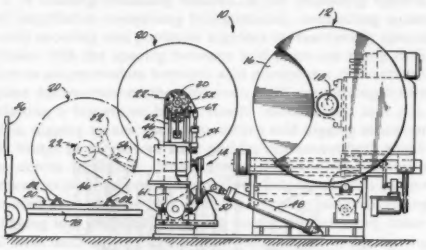
METHOD AND APPARATUS FOR HANDLING LARGE FABRIC ROLLS FOR SLITTING

Ernest L. Lewey, Greensboro; Ned K. Sharpe, Burlington, and James F. Sloan, Greensboro, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Aug. 13, 1974, Ser. No. 497,032
Int. Cl.² B65G *61/00*
U.S. Cl. 214—1 R **11 Claims**

1. A method of handling a roll comprising a length of web material wound around a cylindrical spool, particularly a roll of a large size having a width of the order 144 inches and a diameter of the order of 45 inches, for slitting into a plurality

of rolls of equal diameter and lesser width by rotating said roll and a circular cutter about their axes in parallel relation at an initial slitting position wherein the exterior periphery of the cutter is exterior to the exterior periphery of the web material of the roll and effecting a relative lateral movement between said roll and said cutter from said initial slitting positions to final slitting positions wherein the exterior periphery of the cutter is interior of the interior periphery of the spool of said roll, said handling method comprising the steps of moving a roll into an initial handling position wherein its axis is disposed generally parallel with the axis of rotation at said initial slitting position, supporting the weight of the roll along its lower exterior periphery at said initial handling position, disposing a spindle of a size to fit said spool with end portions extending outwardly thereof in an initial position spaced longitudinally from said roll with the axis of said spindle generally aligned with the axis of said roll, supporting the weight of said spindle at said initial position along the lower periphery thereof at a first position adjacent the end portion thereof adjacent said roll and at a longitudinally spaced second position at the remote end portion thereof, applying longitudinally opposed forces to said roll and to the remote rear end portion of said



spindle acting in a direction toward one another to effect a relative longitudinal movement of said roll and spindle together from said initial positions to interengaged positions wherein said spindle is engaged within the spool of said roll and the end portions thereof extend outwardly of said roll, maintaining the aforesaid support of said roll throughout the aforesaid relative longitudinal movement, maintaining the aforesaid support of said spindle at said second position through said relative longitudinal movement, progressively changing the support of said spindle at said first position longitudinally along the lower periphery of the spindle in a direction toward said second position during an initial portion of said relative longitudinal movement wherein the adjacent end portion of said spindle is engaged within said roll, removing the changing support of said spindle during a final portion of said relative longitudinal movement, removing the application of force to said remote spindle end after said relative longitudinal movement, transferring the aforesaid support of said roll to said spindle by supporting the outwardly extending end portions of said spindle and laterally translationally moving said roll into said initial slitting position through the support of the end portions of said spindle.

3,938,672

DEVICE FOR TRANSFERRING A PLATE-LIKE PRODUCT FROM ONE STATION TO ANOTHER

Matti Olavi Leiponen, Harjavalta, and Tuomo Veikko Juhani Kivisto, Helsinki, both of Finland, assignors to Outokumpu OY, Outokumpu, Finland

Filed Sept. 18, 1974, Ser. No. 506,990

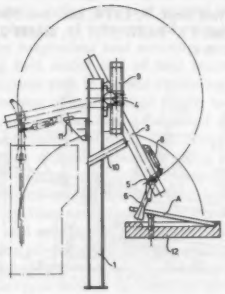
Claims priority, application Finland, Sept. 21, 1973, 2959/73

Int. Cl.[2] B66C *1/54*

U.S. Cl. 214—1 BD **2 Claims**

1. A device for transferring an anode plate from a casting table into a cooling tank, which comprises a base consisting of two spaced vertical pillars;

a metal lifting frame larger than said anode plate, said lifting frame being pivoted to swing about a pair of essentially horizontal pins supported by said pillars for swinging the anode plate through the frame; reciprocally movable grippers for gripping, holding and releasing lugs of the anode plate, said grippers being articulated on a shaft mounted parallel to two sides of said frame; said grippers being mounted to hold said anode plate, after gripping



engagement, in a substantially vertical position after lifting the plate from the casting table and to release the plate into a cooling tank; and

a power mechanism connected to said frame for turning the frame between two positions so that in one position of the frame the grippers can grip the plate lugs at said casting table and in another position of the frame the grippers can place the plate in the cooling tank.

3,938,673

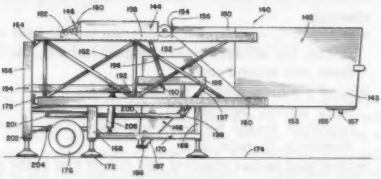
PORTABLE CONCRETE BATCH PLANT

L. F. Perry, Jr., 113 Highview, Georgetown, Tex. 78626

Filed Oct. 7, 1974, Ser. No. 512,517

Int. Cl.[2] B65G *69/00*

U.S. Cl. 214—2 **6 Claims**



1. A portable concrete batch weigh plant comprising support frame means movable between horizontal and vertical positions, cement silo means secured to the support frame means and movable therewith, cement weight bin means secured to the support frame means and movable therewith, said cement weigh bin means being in communication with the cement silo in one position for receiving dry cement therefrom, water weigh bin means secured to the support frame means and movable therewith, aggregate weigh bin means carried by the support frame means and movable independently with respect thereto, means operably secured between the support frame means and aggregate bin means for movement of the aggregate bin means through an overhead arc between lowered positions for loading thereof and raised positions for unloading thereof and for raising and lowering the support frame means between said horizontal and vertical positions, discharge means provided for said cement weigh bin and water weigh bin means for discharging dry cement and water therefrom, and discharge means provided for said ag-

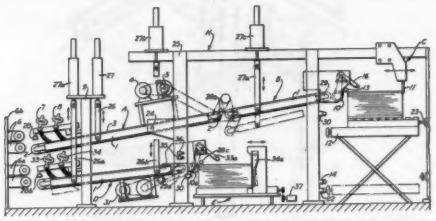
gregate bin means for discharging aggregate from the aggregate bin means in the raised position thereof.

3,938,674

METHOD AND APPARATUS FOR STACKING PAPERBOARD BLANKS

Hendrik J. Kroeze, Albergen, and Hans Scheij, Almelo, both of Netherlands, assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sept. 9, 1974, Ser. No. 504,226
Int. Cl.² B65G *57/112*; B65H *29/22*
U.S. Cl. 214—6 G **6 Claims**



1. Apparatus for forming first and second stacks of blanks from vertically displaced, parallel streams of said blanks comprising:

a first stacking station for stacking the blanks from a first of said streams, said first stacking station including:

a first conveyor means in alignment with said first stream for advancing, in shingled fashion, the blanks from said first stream;

first platform means beneath an output end of said first conveyor means for receiving said blanks in stacked formation thereon; and

first gate means adjacent said output end of the first conveyor means for interrupting the advance of said blanks thereon when the height of said

first stack reaches a predetermined height on said first platform means; and

a second stacking station for stacking the blanks from a second of said streams, said second stacking station including:

a second conveyor means in alignment with said second stream for advancing, in shingled fashion, the blanks from said second stream;

second platform means, downstream from said first platform means, beneath an output end of said second conveyor means for receiving said blanks in stacked formation thereon; and

second gate means adjacent said output end of the second conveyor means for interrupting the advance of said blanks thereon when the height of said second stack reaches a predetermined height on said second platform means, said output end of the first conveyor means being upwardly movable in proportion to an increase in height of said first stack for maintaining a substantially constant fall space between said output end and the top of said first stack,

said second platform means being downwardly movable in proportion to an increase in height of said second stack for maintaining a substantially constant fall space between the output end of said second conveyor means and the top of said second stack; and

switch means for stopping said first and second conveyor means upon respective activation of said first and second gate means,

each of said conveyor means having an input end movable downwardly relative to said first and second streams for accumulating a storage stack of blanks thereon from said first and second streams respectively while said conveyor means are stopped,

each of said first and second gate means including:

first and second roller means between which said blanks pass from the respective conveyor means to the respective platform means, said second roller means movable into engagement with said blanks upon activation of said gate means; and

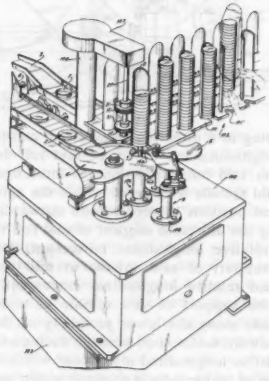
control means for rotating said second roller means after engagement thereof with said blanks to advance blanks then between said first and second rollers onto said stacks on the respective platform means prior to removal thereof from said stacking stations.

3,938,675

PAIRING AND STACKING SYSTEM FOR MOLDED ARTICLES

Herbert Rees, Willowdale, Canada, assignor to Husky Injection Molding Systems Limited, Bolton, Canada

Filed Feb. 24, 1975, Ser. No. 552,180
Int. Cl.² B65G *57/30*
U.S. Cl. 214—6 M **10 Claims**



1. A system for pairing and stacking molded articles of a first and a second type simultaneously coming from a molding machine, comprising:

a pair of rotatable supporting members each having at least one cutout for receiving a molded article of said first and said second type, respectively, said cutouts describing overlapping closed paths and being mutually aligned in a predetermined position of said members;

feed means for respectively supplying said articles of first and second type to said members and depositing an article in each cutout ahead of the region of overlap;

drive means for said members intermittently actuating same with substantial standstill in said predetermined position;

pusher means synchronized with said drive means for jointly dislodging a pair of articles from said cutouts in juxtaposed relationship during standstill of said members; and

receiving means for said pair of articles on the side of said members opposite said pusher means.

3,938,676

FLOATING UNLOADING INSTALLATION FOR LIGHTERS

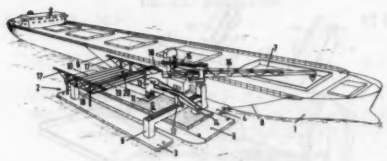
Hendrik Magchiel Willem Croese, Schiedamseweg 103, Vlaardingen, Netherlands

Filed Sept. 30, 1974, Ser. No. 510,715

Claims priority, application Netherlands, Apr. 26, 1974, 7405664

Int. Cl.² B65G 67/58

U.S. Cl. 214—13 8 Claims



1. A floating unloading installation for unloading lighters, said installation comprising two pontoons, connecting means fixedly securing said pontoons together in transversely spaced relation with the spacing between said pontoons being sufficient to accommodate between said pontoons a conventional lighter for movement therebetween, said connecting means including a transverse bridge fixedly mounted on said pontoons, digging means, means mounting said digging means on said bridge in a balanced state and for movement both generally across the space between said pontoons and about a vertical axis to assure the complete unloading of a lighter disposed between said pontoons, said digging means including a digging unit and first conveying means for delivering material from said digging unit to said bridge, said bridge having vertically fixed second conveying means for delivering material to one of said pontoons, and third conveying means for delivering material from said one pontoon away from said installation.

3,938,677

APPARATUS FOR DISTRIBUTING MATERIAL INTO A STORAGE ROOM, SILO AND THE LIKE

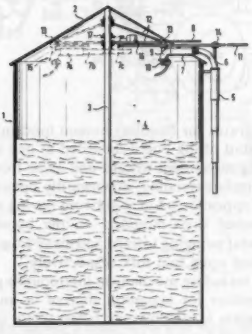
Ernst Weichel, Bahnhofstrasse 1, 7326 Heiningen, Germany

Filed May 22, 1973, Ser. No. 362,871

Claims priority, application Germany, May 25, 1972, 2225387

Int. Cl.² B65G 65/32

U.S. Cl. 214—17 CB 8 Claims



1. Apparatus for distributing stalks, leaves or bulk material into storage spaces, such as silos, hay barracks, hay towers and the like, comprising wall means laterally defining an upwardly extending storage space, a tubular conveyor device for discharging material into said storage space, said conveyor device comprising a first conveyor section for transporting the material to the upper end of said storage space, and at least a second conveyor section in communication with said first section, said second section having an outlet end located in the upper portion of said storage space for discharging material into said storage space, wherein the improvement comprises that said second conveyor section is pivotally displaceable about an axis intersecting its longitudinal axis at a point spaced axially from its outlet end, said second conveyor section comprises a plurality of telescopically displaceable subsections, means for suspending said second conveyor section and for displacing said outlet end of said second conveyor section along an arcuate path in a plane extending transversely of the upward direction of said storage space, said telescopically displaceable sub-sections being extended and retracted during travel of said outlet end along said arcuate path, said first conveyor section extends upwardly along and adjacent the exterior of said storage space, an arcuate bend member connecting said first and second conveyor sections so that said second conveyor section extends transversely of said first conveyor section, said arcuate bend member and said second conveyor section are pivotally displaceable about the vertical axis of said first conveyor section, and said means for suspending said second conveyor section includes an upright column centered within said storage space and the axis of said column defines the center about which said outlet end of said second conveyor section is displaceable along an arcuate path.

3,938,678

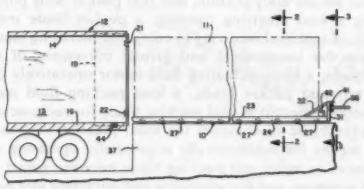
CARGO TRANSPORT SYSTEM

Ruy E. Kern, 1032 Kerri Ann Drive, Martinez, Calif. 94553

Filed Sept. 18, 1974, Ser. No. 507,234

Int. Cl.² B65G 67/02

U.S. Cl. 214—38 D 2 Claims



1. For use in a cargo transport system which includes a forklift truck which incorporates tines having tips, the combination of a container having an interior volume defined by top and bottom walls, a pair of side walls, a front end wall, and a closure at the rear end, a pallet adapted for insertion into and removal from the container, the pallet including a rectangular frame for supporting a load of cargo, the frame having its outer peripheral dimensions substantially commensurate with the peripheral dimensions of the bottom wall of the container, a plurality of rollers mounted on the frame about parallel axes extending transversely of the frame, said rollers being adapted to support the frame and cargo load for rolling movement onto the bottom wall of the container, an upstanding push plate secured at its lower end to one end of the frame, means forming a pair of spaced-apart pockets in the plate for receiving thrust forces from the tips of the tines of the forklift truck, means for locking the tips of the tines within said pockets for imparting pulling forces to the pallet, at least one lock pin mounted for movement on the pallet between a retracted position and downwardly extending locking position, and pin receiving means in the container positioned in register with the locking means when the pallet is carried within the container, said lock pin when in its locking position being engaged in said pin receiving means for precluding relative movement of the pallet with respect to the container.

3,938,679

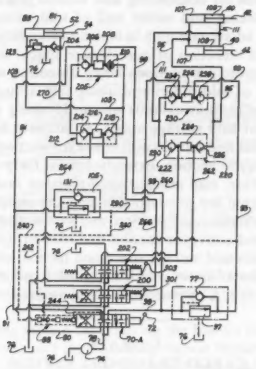
CONTROL SYSTEM FOR REFUSE HANDLING APPARATUS

Richard V. Clucker, Kenton, and Roland R. Kennedy, Galion, both of Ohio, assignors to Harsco Corporation, Camp Hill, Pa.

Continuation-in-part of Ser. No. 187,384, Oct. 7, 1971, Pat. No. 3,760,962. This application Apr. 27, 1973, Ser. No. 354,997

Int. Cl.[2] B65F *3/00*

U.S. Cl. 214—83.3 3 Claims



1. A rear loader type refuse truck comprising, in combination, a body including a forward refuse receiving body portion and a rear packer body portion, said rear packer body portion including a load receiving opening; a packer blade means forwardly of said load receiving opening and including mounting means for longitudinal and pivotal movement of said packer blade; a blade actuating fluid motor operatively connected top said packer blade; a load packing fluid motor operatively connected to said packing blade for reciprocating said packer blade to compact the load; pressure responsive control means for automatically sequentially operating said fluid motors to move said packing blade between raised and lowered positions, and for advancing and retracting said packing blade between load engaging and retracted positions, said pressure responsive control means including a main auto-cycle control valve means and a plurality of pressure responsive valves arranged in circuit with said first and second fluid motors for sequentially energizing said fluid motors to cyclically operate through a plurality of packing cycles, said main auto-cycle control valve means comprising a single spool four-way valve including an inlet communicating with a source of pressurized fluid, a first outlet for delivering pressurized fluid to certain chambers of said fluid motors when said spool of said four-way valve is in a first position and a second outlet for delivering pressurized fluid to certain other chambers of said fluid motors when said spool of said four-way valve is in a second position, said four-way valve including a third centered spool position wherein both of said outlets are isolated from said source of pressurized fluid; a pressure responsive feedback controller that automatically shifts said main auto-cycle control valve means between said positions responsive to the occurrence of predetermined pressure values encountered by said system; emergency stop means for shifting said main auto-cycle control valve to said third control position; and a manual actuator for operating said emergency stop means; and a manual packer blade control valve downstream of said auto-cycle control valve means and in circuit with said blade actuating fluid motor and a manual load packing control valve downstream of said auto-cycle control valve means and in circuit with said load packing fluid motor whereby said auto-cycle control valve means isolates said manual control valves from the pressurized fluid when said auto-cycle valve means is in said closed position.

3,938,680

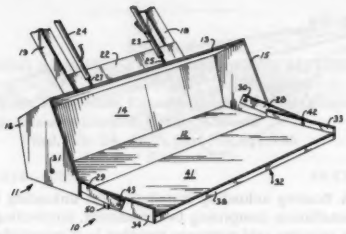
BUCKET ATTACHMENT

Homer L. Grimes, Rural Rte. No. 1, Hepler, Kans. 66746

Filed Aug. 19, 1974, Ser. No. 498,393

Int. Cl.[2] E02F *3/40*

U.S. Cl. 214—145 R 10 Claims



1. An attachment for a vehicle carrying a bucket thereon, said bucket having a top, a bottom, and a pair of opposite sides, said attachment comprising:

arm means adapted for pivotal connection to said bucket;

a platform pivotally coupled to said arm means, said platform and arm means being pivotally movable between a first position wherein said platform forms an extension of said bucket bottom and a second position wherein said platform forms an extension of said bucket top; and

means for locking said platform to said bucket in rigid extension from said bucket top.

3,938,681

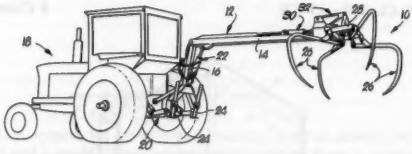
GRAPPLING HAYFORK

Max E. Bennett; James Edson McCanse, both of Oregon, Ill.; Gordon L. Lawson, Postville, and William H. Clark, Waukon, both of Iowa, assignors to Hesston Corporation, Hesston, Kans.

Filed Apr. 8, 1974, Ser. No. 458,523

Int. Cl.[2] B66C *3/04*

U.S. Cl. 214—147 G 7 Claims



1. In apparatus for handling animal foodstuffs:

an elongated lifting boom mounted at one end for vertical swinging movement toward and away from the ground;

a transversely extending, downwardly opening pickup fork on the opposite end of said boom having at least one pair of opposed tines mounted on the boom for generally horizontal swinging toward and away from one another to close and open said fork respectively,

said fork including mechanism intercoupling said tines with one another for actuation thereof in unison when said mechanism is reciprocated transversely of said boom;

power means having a component reciprocable along said beam toward and away from said fork; and

structure operably coupling said component with said mechanism for effecting said transverse reciprocation of

the mechanism during said longitudinal reciprocation of said component whereby to open and close said fork,

said mechanism including means permitting limited unequal swinging of said tines with respect to one another when uneven resistances are encountered during closing of the fork.

3,938,682

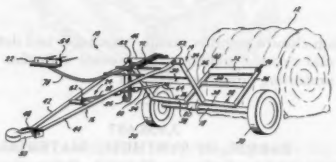
SELF-LOADING HAY HAULER

Carroll Grant Rowe, Rte. 3, Box 236A, Hope, Ark. 71801

Filed Nov. 13, 1974, Ser. No. 523,247

Int. Cl.² B60P *1/04*

U.S. Cl. 214—353 **17 Claims**



1. A device upon which a bale of hay or any other appropriate commodity may be loaded and transported by a towing vehicle, including

a carrier frame upon which the bale rests when it has been loaded, said carrier frame including two side members, each consisting of at least one segment, at least one horizontal bar for connecting and bracing the two side members,

a hitch frame, one end of which is pivotally connected to the carrier frame, while the other end may be connected to the towing vehicle,

an axle and wheels secured to the carrier frame,

braking means for the axle and wheels,

a fork pivotally connected to the carrier frame for pulling the bale onto the carrier frame, said fork falling over and grasping the bale as the device is positioned to pick up the bale, and

a roller bar connected to the rearward end of the two side members, said roller bar providing a point of rotation for the carrier frame when the roller bar contacts the ground for loading the bale onto the carrier frame.

3,938,683

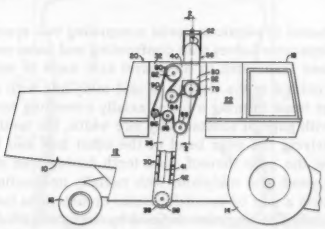
COMBINE GRAIN TANK LOADING CONVEYOR

Darwin Carl Bichel, East Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed Nov. 13, 1974, Ser. No. 523,508

Int. Cl.² B60P *1/40*

U.S. Cl. 214—519 **4 Claims**



1. In a combine having a main separator body with opposite upright side walls, an elevated grain tank, and a clean grain elevator extending upwardly along one of the body side walls for elevating clean grain and having an upper discharge end adjacent the top of the grain tank the combination therewith of an improved grain tank loading conveyor for moving grain from the discharge end of the elevator to the grain tank and comprising: A laterally extending upwardly and inwardly inclined, straight, generally tubular auger housing having a lower intake end communicating with the upper discharge end of the elevator adjacent one side of the grain tank, an upper discharge end above a central portion of the grain tank and a lower end wall normal to the axis of the housing; an auger rotatably mounted in the housing and including an axial shaft; and a gear case mounted on the lower end wall of the housing and including a horizontal input shaft, an inclined output shaft coaxially connected to the auger shaft, and bevel gear means drivingly connecting the input shaft to the output shaft; and drive means operatively connected to the input shaft, for rotating the input shaft.

3,938,684

COMBINE UNLOADING AUGER DRIVE

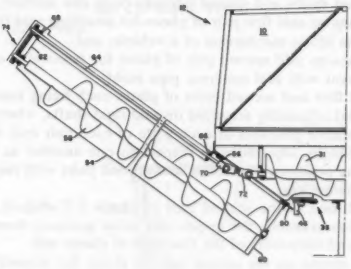
Harald Quoiffy, Homburg, and Norbert Kuhn, Zweibrucken, both of Germany, assignors to Deere & Company, Moline, Ill.

Filed Dec. 23, 1974, Ser. No. 535,414

Claims priority, application Germany, Jan. 3, 1974, 2400200; Jan. 3, 1974, 7400121

Int. Cl.² B65G *65/46*

U.S. Cl. 214—521 **10 Claims**

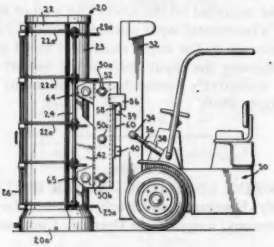


1. In a combine having an operator's station, a power source, and a grain tank, including a feeder auger on the bottom of the grain tank for moving grain from the grain tank to a discharger auger-type conveyor mounted on one side of the grain tank in crop-receiving relationship with the feeder auger and swingably mounted thereon for swinging between a generally fore and aft transport position and a range of unloading positions wherein the conveyor extends generally laterally outwardly and upwardly from the grain tank, the improvement comprising; a drive means operatively connected to the feeder auger and the discharge conveyor and including a clutch means selectively engageable to drivingly connect the feeder auger and the discharge conveyor to the power source; a clutch actuating means operatively associated with the clutch means for controlling the engagement of the clutch means and including a control lever mounted at the operator's station and shiftable between clutch engaging and clutch disengaging positions; and interlock means operatively connected to the clutch actuating means and the discharge conveyor for preventing engagement of the clutch means when the discharge conveyor is not in one of its unloading positions.

3,938,685
MEANS FOR ENGAGING, LIFTING AND TRANSPORTING CONCRETE PIPE MOLDS

Ronald J. Walchek, South Sioux City, Nebr., assignor to Concrete Pipe Machinery Company, Sioux City, Iowa

Filed Mar. 22, 1974, Ser. No. 453,574
Int. Cl.[2] E04G *13/02*
U.S. Cl. 214—621 8 Claims



1. A mold handling apparatus for removable engagement with a concrete pipe mold having at least three longitudinally hinged sections and adapted for attachment to a vehicle having a lifting mechanism, said handling apparatus comprising, in combination:

a frame made up of a first pair of normally vertical rigid plates connected to one another and spaced apart by a pair of elongate, normally horizontal, rigid shafts;

a second pair of normally vertical rigid plates mounted on said shafts and spaced laterally from one another;

means on said first pair of plates for attaching said frame to the lifting mechanism of a vehicle, and

means on said second pair of plates for removable engagement with said concrete pipe mold,

said first and second pairs of plates each being removably and adjustably mounted on said rigid shafts, whereby the relative positions of each plate of each pair may be individually adjusted with respect to one another as well as the positions of the first and second pairs with respect to themselves,

each one of the second pair of plates is C-shaped in side view whereby the upper and lower portions thereof extend outwardly of the first pair of plates and

the means on the second pair of plates for removable engagement with the mold comprise stub shafts, said shafts mounted in opposition to one another on the outwardly extending C-legs, pointing inwardly.

3,938,686
PAINT CONTAINER

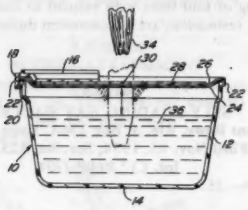
Robert T. Milligan, 532 Leverington Ave., Philadelphia, Pa. 19128, and Robert H. Vernon, Hagues Mill Road, Ambler, Pa. 19002

Filed Nov. 18, 1974, Ser. No. 525,043
Int. Cl.[2] B65D *23/06*
U.S. Cl. 215—232 7 Claims

1. A container means for paints comprising:

an optically clear plastic cup-like container;

a multi-laminate seal secured to the top of said cup-like container, said seal comprising a first film, a second film continuously joined to said first film, and a third film continuously joined to said second film, said third film forming the outer layer of said seal, said first film and said second film being placed in tension during application to said cup-like container, said third film being applied in a relaxed state to said second film whereby when said multi-laminate seal is slit, said seal will flex inwardly when a brush is inserted therethrough and will return to its original plane when said brush is withdrawn thereby enabling the maintenance of a moisture saturated condition of air above paint contained within said plastic cup-like container; and

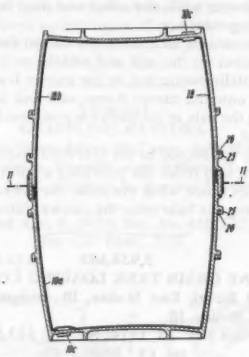


a top closure member readily attachable and detachable to said cup-like container to provide a further means for protecting container contents.

3,938,687
BARREL OF SYNTHETIC MATERIAL

Eckhard Maier, Ettlingen; Heinrich Ostermeier, Herford; Kalman Körmendi, Karlsruhe, and Friedel Schinke, Bunde, all of Germany, assignors to Elbatainer Kunststoff- und Verpackungs- Gesellschaft m.b.H., Ettlingen and Sulo Eisenwerk Streuber & Lohmann, Herford, both of, Germany

Filed Nov. 1, 1973, Ser. No. 412,046
Claims priority, application Germany, Nov. 11, 1972, 2255299
Int. Cl.[2] B65D *11/06*, *45/32*
U.S. Cl. 220—5 R 8 Claims



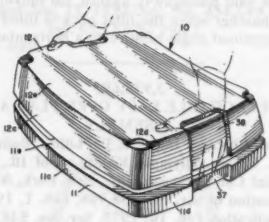
1. A barrel of plastic material comprising two symmetrical, axially separable halves with confronting end faces meeting at a midplane transverse to the barrel axis, each of said halves being provided in the vicinity of said midplane with a peripheral edge bead forming a set of axially extending teeth alternating with gaps of substantially like width, the teeth of each half overlying the edge bead of the other half and being received in the gaps thereof, said teeth having free ends provided beyond said midplane with radially upstanding bosses which form a pair of parallel annular crenelations bounding a substantially flat ring zone defined by the interleaved teeth of said halves, and a generally flat strap inserted under tension between said crenelations and bearing radially inwardly upon said ring zone, thereby forcing said free ends into firm contact with underlying areas of said edge beads forming the bottoms of said gaps, said edge beads being provided with axially extending bracing formations engaging each other across said midplane at locations radially inward from said ring zone.

3,938,688

COVERED SERVING TRAY

Jay Edward Ryan, Wheeling, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jan. 7, 1974, Ser. No. 431,152
Int. Cl.[2] B65D *1/36*; A45C *11/20*
U.S. Cl. 220—23.8 9 Claims



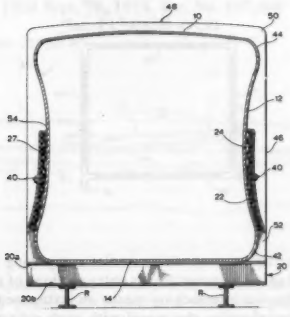
1. A food server combination comprising separable tray and cover sections; said tray and cover sections each having planar body portions and having front, rear, and side walls; said planar body portion of said tray section having a plurality of upwardly-opening recesses for receiving dishes, cups, and the like; one of said recesses being generally centrally disposed intermediate the side walls of said tray section; said planar body portion of said cover section having a plurality of downwardly-opening recesses complementing the recesses of said tray section and including a generally central recess overlying the central recess of said tray section; one of said sections providing a channel extending perimetrically about the central recess thereof and the other of said sections providing a plurality of arcuate circumferentially-spaced shoulders received within said channel; said one section also including a plurality of lug portions in said channel received in the spaces between said circumferentially-spaced shoulders and engagable with the ends of said shoulders for locking said cover and tray sections against relative rotation in planes parallel with said planar body portions.

3,938,689

PROCESSING TANK

Nicholas Marie de Munnik, 450 Walmer Road, Apt. 409, Toronto, Ontario, Canada

Filed July 8, 1971, Ser. No. 486,616
Int. Cl.[2] B65D *25/18*, *7/22*
U.S. Cl. 220—71 12 Claims



1. A tank for flowable material such as fluids, liquid, semi-liquid materials and the like creating substantial hydro-static pressures therein, said tank comprising;

a bottom wall, opposite side walls extending upwardly therefrom and a top wall and two end walls defining an elongated enclosed chamber;

means supporting said bottom wall at spaced intervals and extending from side to side thereof;

side support braces extending upwardly along the exterior of said side walls and having upper and lower ends;

top support braces extending across the exterior of said top wall from side to side thereof;

lower corners joining the lower ends of said side support braces with at least some of said bottom wall supporting means;

upper corners joining the upper ends of said side support braces with respective ends of said top support braces;

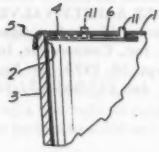
said side walls being characterized by a shape which is inwardly curved along the length of said tank, and said side support braces being shaped to follow the inwardly curved shape thereof, and wherein a straight line passing through a said side support brace and a straight line passing through its respective top support brace intersect one another at right angles at a point lying within the respective said upper corner joining said side brace and top brace, and wherein no such straight lines intersect said side walls or said top wall of said tank.

3,938,690

SPILL-PROOF DRINKING CONTAINER

Robert C. Butler, Rancho Palos Verde, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 8, 1975, Ser. No. 539,445
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—90.4 1 Claim



1. A spill-proof drinking container, comprising

a cover mounted in a substantially leakproof manner over the open mouth of a drinking container and having an opening formed therethrough in the area of the circumference of the cover;

a closure member slidably mounted on the cover for movement over the opening whereby the container is rendered spill-proof and for movement to a position free from the opening whereby a user may pour and drink liquid in the container through the opening in the cover;

guide means on the underside of the cover for guiding the closure member, said closure member being movably mounted in the guide means;

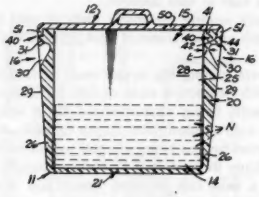
a projecting member extending from the overside of the closure member to facilitate manual movement of the closure member in the guide means; and

compression spring means mounted in close proximity with the closure member in the guide means and abutting the closure member for urging the closure member over the opening.

3,938,691
NEWSPAPER CONTAINER

Sarah J. Dumas, 300 Brentwood Drive NE., Atlanta, Ga. 30305

Filed Aug. 2, 1974, Ser. No. 494,095
Int. Cl.² B65D 25/28
U.S. Cl. 220—94 A 5 Claims

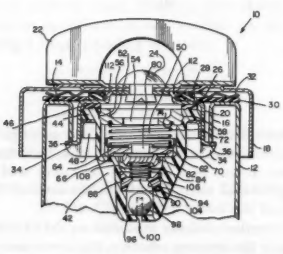


1. A container comprising a receptacle defining an article receiving chamber therein having an open mouth thereto including a side wall including a front wall portion, a rear wall portion and a pair of end wall portions joining said front and end wall portions, a pair of handles on said end walls on opposite sides of said receptacle, and reinforcing means for strengthening said side wall in alignment with said handles to prevent collapse of said receptacle as it is lifted by said handles, said reinforcing means defining an offset section in each of said end wall portions and including a central web angled outwardly from said end wall portion and a pair of side webs joining opposite sides of said central web to said end wall portions; and a closure constructed and arranged to engage said side wall to close said open mouth of said chamber and restrain said side wall about said open mouth against outward movement.

3,938,692
PRESSURE-VACUUM RELIEF FUEL TANK CAP WITH ROLL-OVER SAFETY VALVE FEATURE

Billy G. Crute, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed Sept. 30, 1974, Ser. No. 510,483
Int. Cl.² B65D 51/16
U.S. Cl. 220—203 5 Claims

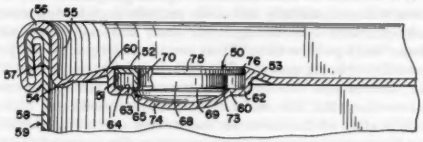


1. A pressure-vacuum cap for a chamber having a normally upwardly extending filler neck formed with a peripherally and radially extending, upwardly facing sealing surface concentric with the longitudinal axis of said neck, said cap comprising a cover, means providing a concentric housing extending downwardly into said filler neck and connected to said cover, means providing a seal between said housing means and said sealing surface, said housing means including a valve body providing a centrally disposed concentric passageway extending axially therethrough and in communication with said chamber, pressure-vacuum valve means disposed in said passageway for normalizing the pressure in such a chamber, venting the chamber to atmosphere when the pressure in the chamber exceeds a predetermined superatmospheric level and when the pressure in the chamber drops below a predetermined subatmospheric level, said valve body including, in said passageway, a resilient plug providing a concentric, axially downwardly facing valve seat with a concentric venting opening extending axially therethrough, and a ball disposed in said passageway to move into closing engagement with said valve seat to close said passageway against the movement of fluid from said chamber when the filler neck is tilted downwardly to a predetermined angle relative to a horizontal plane.

3,938,693
NON-DETACHABLE EASY OPEN FLAP AND TAB ASSEMBLY

Anil U. Patel, Chicago; James V. DePhillips, Bolingbrook, and Harry A. Peyser, Olympia Fields, all of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 438,908, Feb. 1, 1974. This application Feb. 10, 1975, Ser. No. 548,494
Int. Cl.² B65D 43/02, 17/00, 17/24
U.S. Cl. 220—267 10 Claims

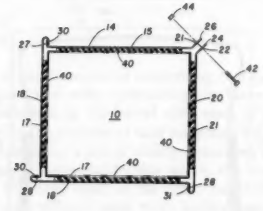


1. In an end panel wall for a container,
a tear open flap offset below the plane of the wall within a recess therein;
a fitment telescoped into the recess and adapted to be pressed against said flap to tear open the same from the end wall to provide a raw-edge pour opening, said fitment dimensioned to tightly fit into the opening and serving as a guard shielding said raw edge of the opening and also as a spout for the contents from the container, and holding means comprising a portion of the panel wall formed to overlap said fitment and hold the same captive against said flap.

3,938,694
EVAPORATIVE COOLER COVER

William A. Archuleta, 4979 S. 4055 West, Kearns, Utah 84118

Filed May 6, 1974, Ser. No. 467,188
Int. Cl.² B65D 7/42; F16L 9/14
U.S. Cl. 220—77 4 Claims



1. A cover for an evaporative cooler comprising a plurality of panels adapted to cover the air entry sections of the cooler, each panel having interlocking means on juxtaposed edges for releasably interlocking the panel with each adjacent panel, each panel having an insulation interposed between the panel and the air entry sections of the cooler to seal the air entry sections of the cooler and opposed edges on the first and last panels having means accommodating means for acting di-

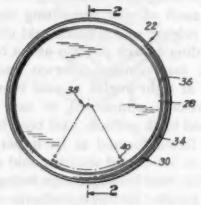
rectly upon said panels to simultaneously progressively tighten all panels against the cooler.

3,938,695

DRINK-THROUGH SLOSH-INHIBITING CLOSURE LIDS FOR POTABLE OPEN-TOP CONTAINERS

Stanley Ruff, 9 Arbor Drive, New Rochelle, N.Y. 10804

Filed Jan. 18, 1974, Ser. No. 434,649
Int. Cl.² F47G 19/22
U.S. Cl. 220—90.4 **7 Claims**



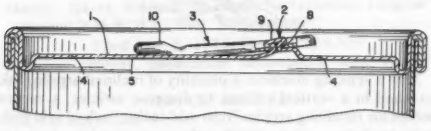
1. A closure lid for capping the open top of a potable container, said lid having peripheral means for releasably sealingly engaging the lip of the container, a crown, and means providing a limited area in said crown having a group of small openings therein at least adjacent the periphery of the crown through which the potable in the container may be drunk through the lid, said crown being imperforate except at said area, the sizes and spacings of said openings inhibiting slosh waves in the potable, said lid having flutes which are expandable downwardly to open up upon application of manual pressure to the crown in the vicinity of the limited area whereby to form a depression to accommodate the nose of a person drinking the potable from the container through the lid, the side walls of the depression acting as baffles to further minimize slosh waves in the potable.

3,938,696

INCLINED INTEGRAL RIVET ON END PANEL FOR TAB CONTROL

Edward J. Herbst, Posen, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Sept. 18, 1974, Ser. No. 507,040
Int. Cl.² B65D 41/32
U.S. Cl. 220—273 **4 Claims**



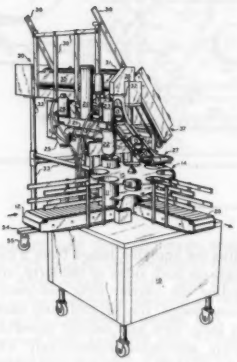
1. An improved easy-opening end closure comprising a substantially planar end panel, a substantially planar tab, a score line formed in said end panel and defining a flap therein for fracturing by the tab to open said closure, and biasing means comprising an offcenter rivet integral with said end panel securing said tab thereto and inclined at an acute angle toward said tab and urging said tab against said end panel.

3,938,697

MAGAZINE FEEDER FOR CIRCULAR ELEMENTS

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 27, 1974, Ser. No. 510,129
Int. Cl.² G07F 11/12
U.S. Cl. 221—11 **17 Claims**



1. Apparatus comprising:

a conveying means for accepting a row of axially aligned articles each having a generally circular outer periphery and delivering said articles to a first end of said conveying means;

dispensing means located adjacent said first end of said conveying means for receiving each of said articles in said row and delivering each said article from said conveying means;

a magazine feeder means for delivering at least one axially aligned row of said articles into said conveying means, said magazine feeder means having at least one compartment for carrying a row of said articles to said conveying means and successively releasing each row so carried into said conveying means;

means for generating a first control signal in response to a substantial depletion of the row of articles within said conveyor means;

magazine drive means for initiating movement of said magazine feeder means in response to the presence of said first control signal;

means for terminating operation of said magazine drive means and halting movement of said magazine feeder means in response to a compartment of the magazine feeder means being brought into position to deliver a row of said articles into said conveying means; and

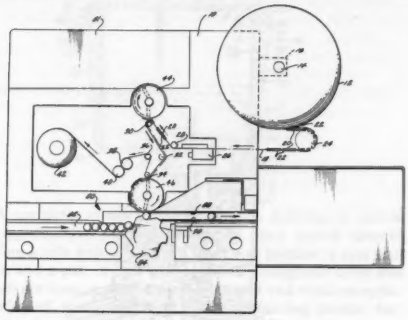
means for automatically reversing said magazine drive means and returning said magazine feeder means to a preselected reloading position in response to the articles in all compartments thereof having been delivered into said conveying trough means.

3,938,698

APPARATUS FOR DISPENSING ADHESIVE LABELS

James E. McDavid, Jr., Chagrin Falls; Stanley E. Truesdell, Mentor, and Elmer Thomas Chipps, Mentor-on-the-Lake, all of Ohio, assignors to Avery Products Corporation, San Marino, Calif.

Filed Nov. 27, 1974, Ser. No. 527,857
Int. Cl.² B65H 5/28
U.S. Cl. 221—73 9 Claims



1. Apparatus for applying labels from a carrier strip having adhesive labels on both sides of the strip, comprising:

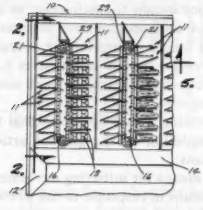
means feeding the carrier strip successively through first and second loops, the second loop being reversed from the first loop, first and second movable transfer means operatively associated respectively with the first and second loops, each transfer means having a surface moving tangential to the labels as they move through a respective one of the loops, means securing each label to the surface of the associated transfer means as it moves through the convex side of the loop, the transfer means pulling each label from the convex side of the carrier strip as it moves through the associated loop.

3,938,699

SPRING CLIP VENDING DEVICE

Francis A. Wittern, 1616 Casady Drive, Des Moines, Iowa 50315, and Arthur N. Wirstlin, 306 3rd St., SE., Altoona, Iowa 50009

Filed Jan. 29, 1974, Ser. No. 437,687
Int. Cl.² G07F 11/42
U.S. Cl. 221—85 1 Claim



1. In a machine for holding and dispensing a plurality of articles individually upon the step-wise advancement of said articles by a motor associated therewith, a vending device comprising:

shelf means for directly supporting a plurality of articles to be vended;

horizontally spaced front and rear members mounted on said shelf means, one of said members being a drive member rotatable in place about a vertical axis;

conveyor means comprised of a continuous loop member horizontally disposed about and drivingly engaged by said drive member;

cam means fixedly mounted upon said shelf means;

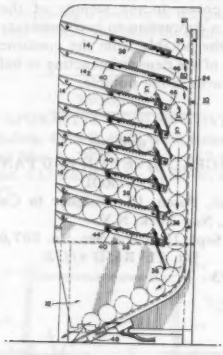
a plurality of dispensing means for releasably and laterally holding the articles on said shelf to be dispensed, said dispensing means being attached at regular intervals along said conveyor means, operation of said conveyor means causing said dispensing means to periodically coact with said cam means to thereby cause said dispensing means to release said article to be dispensed, said dispensing means each including a cradle and a spring clip member adapted to hold an article therebetween, said spring clip member being biased against said article to be dispensed, said bias being overcome upon engagement of each of said dispensing means with said cam means to release said articles, said cradle being L-shaped and including a back portion and a base, said base being affixed to said conveyor means and said back portion extended at right angles to said base, said clip member being pivotally connected to said cradle and biased toward said back portion, said base having a horizontally disposed flame formed at its upper end and a biasing flange at its lower end securing said clip member in biasing relation, said biasing flange being formed at an angle between parallel and perpendicular to the plane of said base, and said clip member having a pair of projections inserted through openings formed therefor in said flanges.

3,938,700

MULTI-RACK ARTICLE DISPENSING APPARATUS

Vernon Doyle Camp, and Harry R. Payne, both of Chattanooga, Tenn., assignors to Cavalier Corporation, Chattanooga, Tenn.

Filed Nov. 25, 1974, Ser. No. 527,156
Int. Cl.² G07F 11/12
U.S. Cl. 221—109 5 Claims



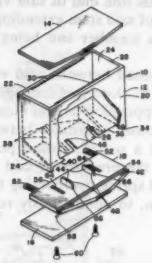
3. In a vending machine, a plurality of inclined article racks attached in a vertical column to dispense articles, a vertical access for receiving articles from said racks, each of said racks having a lower end, an article release mechanism pivoted to said lower end of each of said racks, means for controlling said articles in said rack to prevent the release of articles when said release mechanism contacts an article in said vertical access, comprising a releasing plate having a first and a second portion divided by a pivot support, said first portion being longer than said second portion and being of a size to support a plurality of articles, said second portion being in the same plane as said first portion and being of a size to prevent articles from being released from said inclined rack.

3,938,701

TOOTHPICK DISPENSER

Francis J. Jones, 11035 W. 26th Ave., Lakewood, Colo. 80215

Continuation of Ser. No. 299,845, Oct. 24, 1972, abandoned.
This application Mar. 26, 1974, Ser. No. 454,813
Int. Cl.² B65G 59/06
U.S. Cl. 221—184 6 Claims



1. A dispensing apparatus for toothpicks or the like comprising, a receptacle in which a plurality of the toothpicks can be stored in stacked substantially parallel relationship, said receptacle having an inclined lower surface on which the toothpicks are supported with at least one slot through the inclined surface along a lowermost edge thereof, a discharge opening adjacent the lowermost edge of the inclined surface through which toothpicks can pass one at a time, a slide member slidably received in a lower portion of the receptacle beneath the inclined surface, elongated delivery channel means in the slide member adapted to retain a single toothpick and movable with the slide member between a receiving position beneath the discharge opening and a removal position exteriorly of the receptacle whereby a toothpick in the delivery channel can be carried from the receptacle to a position exteriorly of the receptacle, and alignment finger means affixed to and protruding upwardly from said slide member through each slot in the inclined surface and being slidable through the slot in a direction parallel to the direction of sliding movement of the slide member to align toothpicks in a single-file stack with the discharge opening whereby to cause the toothpicks to pass one at a time through the discharge opening when the delivery channel is moved beneath the discharge opening and said slide member being retained in the lower portion of the receptacle by a bottom plate, and further including guide slots in said slide member and means on the bottom plate communicating with the guide slots to guide movement of the slide plate so that it does not become misaligned within the receptacle.

3,938,702

DEVICE FOR DELIVERING OBJECTS OF NON-UNIFORM THICKNESS

Marten Geert Aalpoel, Nuenen, Netherlands, assignor to Arenco P.M.B. B.V., Best, Netherlands

Filed Apr. 8, 1974, Ser. No. 458,899
Claims priority, application Netherlands, Apr. 11, 1973, 7305092
Int. Cl.² B65H 5/16
U.S. Cl. 221—238 11 Claims

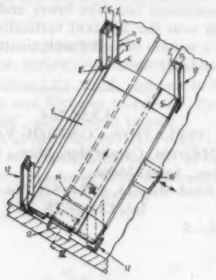
1. A device for delivering objects of non-uniform thickness one by one from a pile of such objects, comprising in combination:

a generally horizontal plate for supporting the pile of objects;

first stop surface means disposed in upstanding relation to said plate for engaging one side of the pile of objects;

second stop means disposed in upstanding relation to said plate and at right angles to the first stop surface means, said second stop surface means presenting first abutment means for engaging a side of the pile of objects and second abutment means, offset from the first abutment means, for allowing the lowermost object in the pile to be displaced partially beneath the first abutment means;

said first stop surface means having a delivery gap adjacent said plate and extending from said second abutment means outwardly from beneath said first abutment means to a position allowing displacement of the lowermost object only when such lowermost object is displaced



partially beneath said first abutment means and into engagement with said second abutment means;

pusher means reciprocable toward and away from said second stop surface means to displace a lowermost object against said second abutment means; and

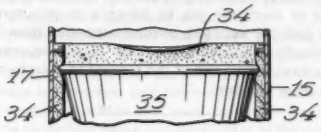
feed means spaced from said first stop surface means and aligned substantially centrally with respect to said delivery gap, said feed means engaging a lowermost, displaced object for delivering such lowermost object through said delivery gap.

3,938,703

DISPENSING CARTON FOR NESTABLE CUPS

Harry I. Roccaforte, Western Springs, Ill., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Feb. 19, 1975, Ser. No. 550,947
Int. Cl.² A47F 1/08
U.S. Cl. 221—305 4 Claims



1. A blank made from foldable paperboard or similar sheetlike material adapted to be folded into a tubular carton suitable for containing and dispensing a stacked array of nestable cups or the like, said blank comprising:

a substantially rectangular sheet of said paperboard, said sheet having parallel top and bottom edges and parallel lateral edges arranged at right angles to said top and bottom edges;

four side wall panels defined by three vertically oriented fold lines spaced intermediate said lateral edges and arranged parallel thereto, said side panels having substantially equal width;

closure flaps hingedly connected along said top edge of said blank to said wall panels and adapted to be folded to form a top closure for said carton in the finally erected configuration;

bottom closure flaps hingedly connected along said bottom edge to said side panels and adapted to be folded into a bottom closure for said carton in its finally erected configuration;

means formed integral with said blank and extending across the lower end of said blank for effecting removal of the lower portion of said blank including said bottom closure to provide access to said cups in the final erected configuration of the carton; and

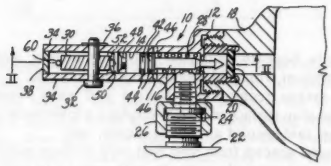
a layer of expanded foam plastic on at least one of said side walls positioned near the lower end thereof, said layer attached near the adjacent vertically oriented fold lines leaving a section of said plastic unattached near the center of said side walls.

3,938,704

INFLATION CONTROL VALVES

Jerome H. Milgram, Cambridge, Mass., assignor to Offshore Devices, Inc., Lynn, Mass.

Filed May 23, 1974, Ser. No. 472,620
Int. Cl.² B67B 7/24
U.S. Cl. 222—5 **4 Claims**



1. A valve for controlling the inflation of a device from a pressurized gas container having a frangible diaphragm closure, comprising a body formed with an interior guideway, a puncturing pin slidably retained in the guideway for movement toward and away from the diaphragm, means including a cam for advancing the pin to puncture the diaphragm, and a lanyard for imparting rotary motion to the cam, said lanyard having a fixed end with an enlarged member disposed in a recess in the cam, said lanyard extending around a portion of the periphery of the cam to a free end which extends away from the cam, said enlarged member and said recess being so shaped and dimensioned that when the free end of the lanyard is pulled, rotary motion is imparted to the cam by the enlarged member to force the pin to advance to puncture the diaphragm and the enlarged portion separates from the recess automatically thereafter when the recess becomes aligned with the direction of pull of the lanyard to thereby release the lanyard from the cam.

3,938,705

ASPIRATING SYSTEM

Thomas P. Cramer, 508 Culler Ave., Frederick, Md. 21701

Filed Oct. 23, 1969, Ser. No. 869,453
Int. Cl.² B67D 5/08
U.S. Cl. 222—59 **1 Claim**

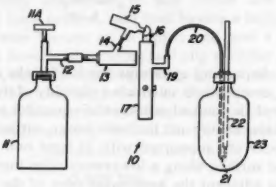
1. A system for delivering aspirated dry powder at a constant rate operated by high pressure fluid comprising:

a venturi aspirator containing a predetermined quantity of dry powder, an exhaust tube with one end embedded in said dry powder and its other end extending outside of said aspirator, and a pressure fluid inlet tube provided with a return bend portion smaller than and extending into said exhaust tube one end,

a miniature flow regulator having a body with an exit port in fluid communication with said aspirator inlet tube, a high pressure fluid supply passage normally in fluid communication with said exit port, and an internally and longitudinally biased piston slidably mounted in said body so that said piston is normally in fluid communication with said passage, said piston being directly responsive to the pressure of said high pressure fluid,

a normally opened valve member sealingly secured in said passage and having a valve stem longitudinally slidably with clearance in said valve member, said stem having one end portion secured to a cap which is capable of seating against one end of said valve member, the other end portion of said stem extending through the other end of said valve member and being in abutment with said piston,

a spring interposed between said valve member and stem and tending to close said cap against said valve member one end in opposition to said biased piston, whereby said cap continuously alternates between an unseated, open position and a seated, closed position in direct dependence upon the pressure of said high pressure fluid and force of said spring overcoming the biasing force of said biased piston, to continuously regulate the flow of said



high pressure fluid to said exit port depending on the predetermined biasing force of said biased piston, and

a piston pulsing unit interposed between said regulator and said aspirator, said unit having a body with a central passage and a lateral exit port in fluid communication with said central passage and said aspirator inlet tube, an accumulator secured to one end of said pulsing body adjacent said lateral port and in fluid communication with said regulator exit port, an elongated piston member slidably mounted in said central passage, one end of said piston member having longitudinally spaced peripheral seals with one of the seals being movable to and from a position intermediate said accumulator and lateral port, longitudinally spaced but adjacent peripheral grooves in said piston member, a spring biased ball detent located in a lateral recess provided in said unit body and alternately engageable in said grooves, and means biasing said piston member toward said accumulator in opposition to fluid delivered from said accumulator.

3,938,706

MECHANICAL FLUID AND PASTE DISPENSER

Milton J. Cohen, 9201 Persimmon Tree Road, Potamac, Md. 20854

Continuation-in-part of Ser. No. 308,548, Nov. 21, 1972, abandoned. This application Aug. 27, 1973, Ser. No. 392,089
Int. Cl.² B65D 35/20
U.S. Cl. 222—83.5 **2 Claims**

1. In a bag type fluid and paste dispenser comprising a rigid housing which is open at the bottom end and which is adapted to be held by the hand, a collapsible sealed bag which contains a fluid or paste material to be dispensed dimensioned to be received in the housing, a closure on the upper end of the housing, a hollow tubular member extending into the interior of the housing for piercing the bag when in position of use to communicate the fluid or paste with a dispensing valve, and means for pressurizing the fluid and paste material within the bag comprising a disc member dimensioned to be received in a telescoping relation within the open end of the housing adjacent the bottom side for displacement of the disc member relative to the housing and the bag through the housing into

and out of engagement with the bag to effect pressurization of the contact material within the bag, means for actuation of the disc member for movement relative to the housing, and an operative connection between the disc member and the walls of the housing for restraining the disc member in position to which it is displaced within the housing, in which the operative connection between the disc member and the walls of the housing comprises rack teeth extending inwardly from the

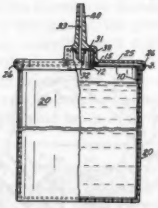
inner walls of the housing through a substantial length of the housing, said disc member being dimensioned to have a width slightly greater than the distance between the crests of the rack teeth on opposite sides of the housing whereby the edges of the disc member are resiliently deflected responsive to engagement with the rack teeth during displacement inwardly through the housing and are restrained by the rack teeth from displacement in the opposite direction.

3,938,707

FLUID CONTAINING AND DISPERSING STRUCTURE

Justin M. Schmit, Pompano Beach, Fla., assignor to Arctic Pac, Inc., Fort Lauderdale, Fla.

Filed Mar. 6, 1974, Ser. No. 448,617
Int. Cl.² B67B 7/28
U.S. Cl. 222—83.5 **6 Claims**



1. In a liquid containing and dispensing device:

a. a sealed liquid-containing pouch having at least one flexible upper wall portion;

b. relatively rigid tubular member positioned within the pouch and its flexible upper wall portion and being secured to said wall portion with the latter extending across one end of the tubular member in sealing relation;

c. means positioned around the rigid tubular member with the flexible upper wall portion of the liquid-containing pouch thereon and securing the tubular member in the upper wall portion of the liquid-containing pouch;

d. a container having relatively rigid side walls surrounding said pouch in supporting relation and having an interior with configurations and dimensions generally complementary to the exterior of said pouch;

e. a top wall structure for the container constructed and arranged to be removably connected to the side wall structure, and,

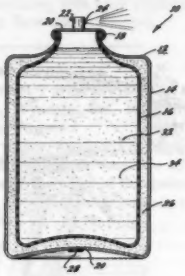
f. a pouring structure integral with the top wall structure and removably connectable to the pouch at the rigid tubular member and including a tubular member receiving and piercing means which receives and positively engages said tubular member in interengaging and telescoping relation, said piercing means piercing said flexible wall portion of said pouch when the latter is so received into the rigid tubular member thereby bringing the same into fluid communication with the interior of said pouch to facilitate pouring of the liquid from said pouch outwardly through said pouring structure.

3,938,708

AEROSOL DISPENSING SYSTEM

Norman D. Burger, Culver City, Calif., assignor to Norman D. Burger, Culver City and Nicholas Mardesich, Palos Verdes Estates, both of, Calif., part interest to each

Continuation-in-part of Ser. No. 497,613, Aug. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 466,140, May 2, 1974, abandoned. This application Jan. 27, 1975, Ser. No. 544,390
Int. Cl.² B65D 35/28
U.S. Cl. 222—95 **35 Claims**



1. An aerosol dispensing system comprising:

an outer container;

compressible inner container means positioned within said outer container;

means to compress said inner container means positioned between said inner container means and said outer container;

a mechanical breakup spray head and valve assembly connected to said inner container means;

a relatively non-foaming liquid product at a pressure above atmospheric pressure within said inner container means due to the force exerted on the inner container means by said means to compress said inner container means;

a neutral propellant within said inner container means;

said neutral propellant being in a liquid state at the pressure within said inner container means and being at least partially soluble or miscible in said liquid product, and

said neutral propellant being at least partially vaporized at atmospheric pressure or less on passage of said product and neutral propellant through said spray head to create a turbulence within said spray head which produces breaking up of said liquid product into a fine spray.

27. An aerosol dispensing system comprising:

an outer container;

compressible inner container means positioned within said outer container;

means to compress said inner container means positioned between said inner container means and said outer container;

a mechanical breakup spray head and valve assembly connected to said inner container means;

a finely divided powder product at a pressure above atmospheric pressure within said inner container means due to

the force exerted on said inner container means by said means to compress said inner container means;

a liquified neutral propellant within said inner container means;

said neutral propellant being present in an amount sufficient to form a slurry with said product and to carry said product into said spray head during discharge of said product, and

said neutral propellant being at least partially vaporized at atmospheric pressure or less on passage of said product and neutral propellant through said spray head to create a turbulence within said spray head which produces a fine powder spray.

3,938,709

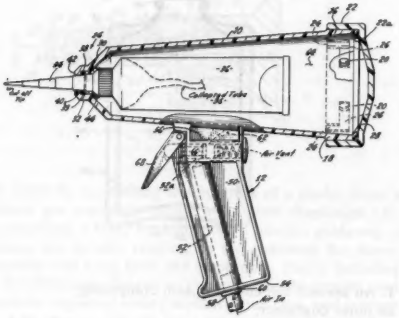
GAS PRESSURE ACTUATED PLASTIC SQUEEZE DISPENSER AND VALVING MEANS THEREFOR

Roland W. Collar, Sun Valley, Calif., assignor to Techon Systems, Inc., Gardena, Calif.

Continuation of Ser. No. 246,542, April 24, 1972, abandoned. This application Feb. 25, 1974, Ser. No. 445,797

Int. Cl.² B65D *35/28*

U.S. Cl. 222—95 **2 Claims**



1. Air compression means to apply air under pressure to the outside of a squeezable tube containing an extrudable plastic material and having nozzle at one end thereof through which such material is extrudable, said means comprising:

an elongated housing, said housing defining a chamber to receive said tube and having a removable closure at one end and an opening at the other end, said housing receiving said tube with its nozzle disposed in said opening and having sealing means about said opening to seal the tube nozzle therewithin, said sealing means including:

a radially inwardly extending flange at the remote end of the housing defining said opening, an O-ring abutting said flange, and a cylindrical conical grommet, said grommet being dimensioned to fit tightly within the housing portion defining the opening and including an inwardly extending sharp annular rib, said rib serving to bite into the tube nozzle when inserted in said grommet, whereby said nozzle is inhibited from inadvertently being withdrawn from said opening when said chamber is not filled with gas under pressure;

a source of gas under pressure;

passage means connecting said source to said chamber; and

valve means interposed in said passage means, said valve means including manual triggering means, whereby the gas under pressure may be selectively admitted through said passage means into said chamber upon manual actuation of said trigger means, and upon release of the trigger means, the gas under pressure in said chamber is vented to the atmosphere.

3,938,710

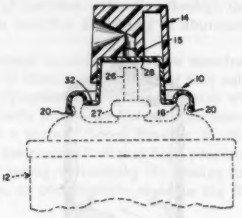
SAFETY DEVICE FOR AEROSOL CAN

Robert A. Bennett, Easton, Conn., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 13, 1975, Ser. No. 540,594

Int. Cl.² B67B *5/02*

U.S. Cl. 222—153 **3 Claims**



1. A safety device for aerosol cans having an upper circular rim, a spray nozzle and a spray stem, comprising:

A. an outer annular overhang member removably mountable about the upper circular rim of the aerosol can;

B. an annular table terminating at its outer periphery with the inner termination of said overhang region for placement of the aerosol can spray nozzle thereon; and

C. a cylindrical sidewall downwardly depending from the inner termination of the annular table so as to provide structural rigidity to the device as well as preventing downward movement of the spray nozzle with respect to the aerosol can and thereby preventing depression of the spray stem by the spray nozzle.

3,938,711

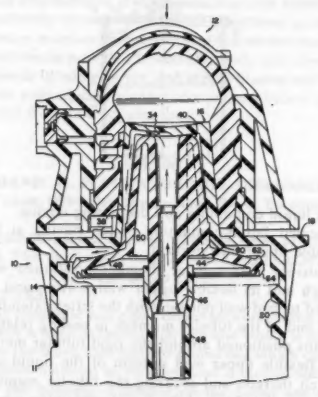
SELF PRIMING MECHANISM FOR DISPENSER

Ronald F. Ewald, Rolling Meadows, and Raymond M. Konarski, Carpentersville, both of Ill., assignors to Seaquist Valve Company, Cary, Ill.

Filed Sept. 16, 1974, Ser. No. 506,008

Int. Cl.² B65D *37/00*

U.S. Cl. 222—209 **9 Claims**



1. A self prime mechanism for use with a dispenser which utilizes a dispensing means of the type having a dip tube, said self prime mechanism comprising: a container attachment means, a dip tube sealer comprising a collar and a dip tube tail, a feedback passage disposed in communicating relation from the interior of said dip tube to the head space of the dispenser, said collar being positioned in said feedback pas-

sage, said dip tube sealer being movable between an open and a sealed position as said container attachment means is sealed to the container, whereby air trapped in said dip tube is permitted to flow back into said head space before said container means is sealed.

3,938,712

APPARATUS FOR MEASURING OUT PULVERULENT MATERIALS

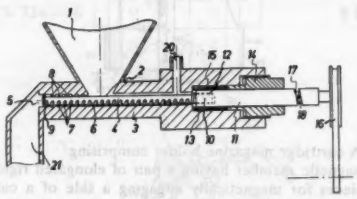
Teddy Durieux, Jemeppe-sur-Sambre, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Mar. 26, 1974, Ser. No. 454,799

Claims priority, application France, Mar. 26, 1973, 73.10851

Int. Cl.² G01F *11/00*

U.S. Cl. 222—404 **5 Claims**



1. In apparatus for measuring out pulverulent materials, which apparatus includes a screw presenting a side root surface and positioned, and rotatably mounted, in a barrel open at at least one of its ends, the improvement wherein the thread of said screw extends from said surface and is interrupted between only two diametrically opposite generatrices of the latter for causing said side surface to consist of a single threaded zone and a single smooth zone, and said apparatus further comprises fixed scraping means cooperating with said threaded zone of said screw, said fixed scraping means comprising several teeth lined up along an axis parallel to the longitudinal axis of the barrel, the distance between said teeth being equal to, or a multiple of, the pitch of the thread, each of said teeth having a profile such that it meshes with, and occupies substantially the entire space between, two consecutive threads of said screw, and drive means to rotate and reciprocate said screw in order to allow said threads to synchronously mesh with said teeth of said scraping means.

3,938,713

FLOW REGULATOR FOR SEDIMENT COLLECTING CHAMBERS OF A SEPARATING DEVICE

Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex B.V., Assendelft, Netherlands

Filed May 28, 1974, Ser. No. 472,946

Int. Cl.² B67D *3/00*; B01D *21/10*

U.S. Cl. 222—486 **10 Claims**

1. In a flow regulator for the sediment discharge from two adjoining hopper-shaped sediment collecting chambers, wherein a substantially vertical partition separates the collecting chambers, and wherein the collecting chambers include a common side wall at the lower end thereof, the improvement comprising:

means forming an opening in said side wall and communicating with each chamber separated by the vertical partition,

rotatable disc means mounted in said side wall adjacent to the partition,

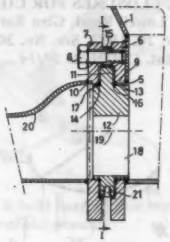
the partition extending at least the full diameter of said disc,

means forming an opening in said disc,

the axis of rotation of the disc being in general alignment with the partition,

the opening in said disc being asymmetrically disposed relative to the axis of rotation,

the opening in the side wall being larger than the opening in the disc such that upon rotation of the disc the opening in the disc remains within the opening of the side wall,



said disc including means to effect rotation thereof in the opening of said side wall, and

rotation of the disc being operative to vary the area of the opening communicating with each chamber whereby the ratio of discharge flow may be varied.

3,938,714

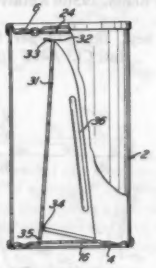
POURING SPOUT DISPENSING SYSTEM

Morris Coppersmith, Wyncote, Pa., assignor to Packaging Aids, Inc., Wyncote, Pa.

Continuation-in-part of Ser. No. 260,860, June 8, 1972, Pat. No. 3,831,824. This application Aug. 26, 1974, Ser. No. 500,755. The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.

Int. Cl.² B67D *3/00*

U.S. Cl. 222—525 **10 Claims**



1. A dispensing system comprising:

a. a longitudinally extended container having opposing wall members displaced each from the other, at least one of said wall members having a removeable section formed integral with said wall member in a plane substantially coincident with said wall member for forming an opening of predetermined contour when at least a portion of said removeable section is displaced from said wall member;

b. a spout member located wholly within said container when said removeable section is contiguous to said wall member throughout said predetermined contour, said spout member extending substantially between said opposing wall members when said spout member is located wholly within said container and free floating within said container, said spout member being only partially removeable from said container through said opening when said removeable section is displaced from said wall member; and,

c. means for releaseably securing said spout member to said container when said spout member is only partially removed from said container through said opening by gravity assist, said releaseable securing means forming a

groove passing throughout a peripheral boundary of one end of said spout member for releaseably capturing a wall section of said wall member opening contour.

3,938,715

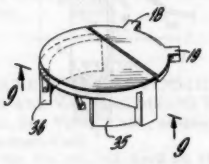
PROTECTIVE CLOSURES FOR CONTAINERS

Clayton Bogert, 118 Lowell Road, Glen Rock, N.J. 07452

Filed Nov. 20, 1972, Ser. No. 307,880

Int. Cl.² B65D *55/14*

U.S. Cl. 222—534 **6 Claims**



1. A safety closure for containers comprising:

a neck portion on a container,

a liftable cap for the container,

means comprising slots in said neck portion and cooperating lugs on the cap to interengage said neck portion and said cap,

a sleeve surrounding said neck portion and said cap, and means to interlock the sleeve and the cap to prevent inadvertent opening of said cap.

3,938,716

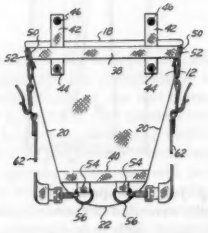
CONVERTIBLE BACK-PACK PANNIER

W. Shaun Jackson, 809 Sycamore, Ann Arbor, Mich. 48104, and Leslie Eric Bohm, 29560 Rutherland, North, Southfield, Mich. 48076

Filed Sept. 18, 1974, Ser. No. 507,061

Int. Cl.² A45F *3/04*

U.S. Cl. 224—9 **12 Claims**



1. A bag adapted to be attached to the rear wheel carrier of a cycle for use as a pannier or convertibly used as a back-pack, comprising: first and second fabric sections, each having a straight base edge and a pair of substantially straight side edges forming substantially equal and opposed acute angles with the base so that the side edges are directed toward one another in a direction away from the base and are joined to one another at their ends opposite to the base; a side panel extending fully about the perimeters of said two sections and joining the sections together in spaced relationship to one another so as to enclose a volume; separable closure means providing access to the interior of the volume of the bag; first fastener means secured to the second section adjacent to the bass edge and adapted to fasten to the carrier of a cycle so that the base edge extends parallel to the carrier and the bag extends downwardly therefrom; and second fastener means affixed to the second section adjacent the base and the end opposite the base and adapted to secure back-pack straps to the bag so that the bag may be attached to and supported on the back of a wearer with the base projecting downwardly.

3,938,717

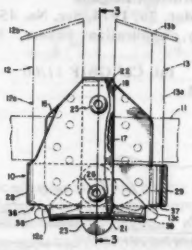
MAGAZINE HOLDER

Paris Theodore, 24 E. 73rd St., New York, N.Y. 14304

Filed Feb. 1, 1974, Ser. No. 438,656

Int. Cl.² F42B *39/00*

U.S. Cl. 224—13 **8 Claims**



1. A cartridge magazine holder comprising:

a magnetic member having a pair of elongated rigid pole-pieces for magnetically engaging a side of a cartridge magazine so as to hold the magazine in parallel alignment with the long axis of said magnetic member;

a piece of flexible sheet material mounted on said magnetic member so as to form a loop extending around the cartridge magazine to hold the cartridge magazine in alignment with said magnetic member and prevent lateral withdrawal or shifting of the magazine while allowing the magazine to be withdrawn base-first in a direction parallel to the long axis of said magnetic member, said loop leaving the nose of the first cartridge exposed so as not to disturb its alignment with the lips of the magazine, and leaving a sufficient portion of the base of the cartridge magazine exposed to allow a user to securely grasp the magazine for withdrawal; and

means for mounting said magazine holder on the belt of a user.

3,938,718

BACKPACK FRAME AND ASSEMBLY

George Benjamin Madison, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Apr. 11, 1974, Ser. No. 459,876

Int. Cl.² A45F *3/00*

U.S. Cl. 224—25 A **14 Claims**

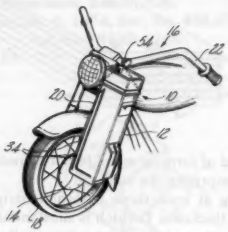
1. A backpack assembly comprising: a one-piece skeletal plastic frame including an integral peripheral frame portion having an upper frame member, first and second side frame members, and a lower frame member, said frame further including a backplate and a skeletal frame gridwork integrally connecting said backplate with said peripheral frame, said peripheral frame defining a first plurality of elongated slots extending along substantially the entire length of said first and

second side frame, said backplate defining a second plurality of elongated slots therein; a backband secured to said frame through said first plurality of slots; a pair of shoulder straps secured at their upper ends to said frame at said second plurality of slots and secured at their lower ends to said frame at said first plurality of slots; fastener means for securing the end portions of said shoulder straps to said frame; and a waistband assembly carried by said frame at said first plurality of slots; whereby said shoulder straps, backband and waistband may be independently adjusted on said frame in accordance with the location of said slots.

3,938,719
STORAGE MEANS FOR MOTORCYCLES AND LIKE VEHICLES

Ronald C. Carlton, 1002 Welch Blvd., Flint, Mich. 48504

Filed Aug. 24, 1973, Ser. No. 391,457
Int. Cl.² B62J *7/02*
U.S. Cl. 224—36 **8 Claims**



1. In combination with a two-wheeled vehicle having a frame structure extending from a wheel axle, a storage means comprising:

a. a support structure comprising a first leg extending parallel to and co-axial with the axle of a wheel and having a lip formed at its upper end, and a second leg substantially perpendicular to the first leg and formed at the lower end of the first leg and having an aperture formed therethrough, the first leg abutting the frame substantially along the extent of the first leg,

b. means for attaching the first leg to the frame structure, the lip preventing the slippage of the leg past the means for attaching,

c. a carrier for storing and transporting goods therein, the carrier having an aperture formed in the bottom thereof, the bottom seating on the second leg and the aperture being in registry with the aperture formed in the second leg, and

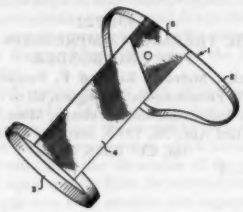
d. quick detachment means extending through the registering apertures for detachably supporting the carrier on the second leg of the support structure.

3,938,720
WALLET WITH CARRYING HARNESS

La Verne M. Vela, 675 Pearson, Ferndale, Mich. 48220

Filed Dec. 10, 1970, Ser. No. 96,849
Int. Cl.² A45C *1/00*
U.S. Cl. 224—5 R **1 Claim**

1. The method of concealing a pocket-like member on the person which resides in suspending beneath the person's clothing under tension lengthwise and sidewise between an elastic band which fits snugly around the waist and an elastic band which fits snugly around an upper thigh of the person so

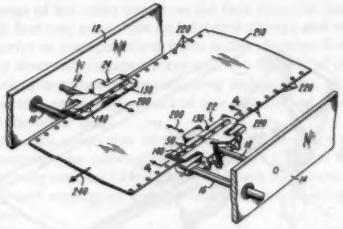


that the member is held snugly against the body between the waist and a thigh of the person.

3,938,721
PIN BELT MECHANISM FOR MOVEMENT OF A CONTINUOUS STRIP

Robert W. Staneck, and George R. Spaleny, both of Dayton, Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Aug. 19, 1974, Ser. No. 498,636
Int. Cl.² G03B *1/30*
U.S. Cl. 226—75 **3 Claims**



1. Mechanism for movement of a continuous strip provided with a longitudinal row of apertures comprising:

a pair of parallel shafts, there being a first shaft and a second shaft, the strip being arranged to move at right angles to the shafts, the shafts being longer in length than the width of the strip.

a carriage having an opening therethrough, the first shaft extending through the opening, the carriage being movable along the first shaft,

a drive wheel, the second shaft extending through the drive wheel for rotation of the drive wheel with rotation of the second shaft, the drive wheel being movable along the second shaft,

a second wheel rotatably carried by the carriage and spaced from both of the shafts,

a continuous belt encompassing the drive wheel and the second wheel for rotation therewith,

a plurality of pin members carried by the belt, each of the pin members extending through the belt and being movable with rotation of the belt,

the carriage having a second opening adjacent the first said opening, the openings being connected by a slot therebetween, a threaded stud extending into the carriage through the slot and having a head portion engageable with a portion of the carriage which is adjacent the slot, the threaded stud being rotatable to slightly move said portion of the carriage to change the dimension of the slot and to change the dimension of the openings, to provide

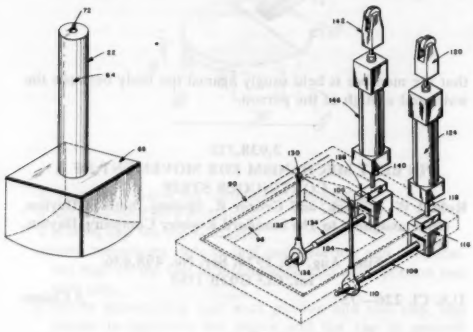
a clamping pressure upon the shaft which extends through the first said opening.

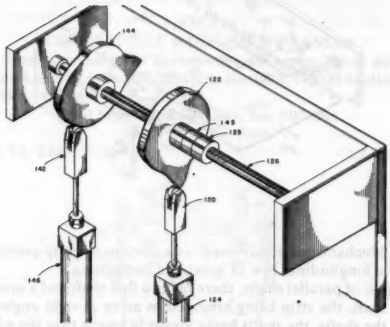
3,938,722

ULTRASONIC THERMAL COMPRESSION BEAM LEAD, FLIP CHIP BONDER

James E. Kelly, Melrose; Richard F. Foulke, Carlisly, and Raymond T. Fitzsimmons, Lexington, all of Mass., assignors to Mech-El Industries, Inc., Woburn, Mass.

Filed Apr. 30, 1973, Ser. No. 355,889
Int. Cl.² B23K *21/02*
U.S. Cl. 228—1 **10 Claims**





1. A bonding apparatus for bonding electrical leads of beam lead devices and flip chip devices to mating conductive surfaces or a substrate and for bonding electrical leads to contact pads on a semiconductor device comprising:

a bonding tool having bonding surfaces disposed substantially about the periphery of one end of said tool;

a tool holder adapted to receive said tool at one end thereof, such that the longitudinal axis of said tool holder is perpendicular to the longitudinal axis of said bonding tool;

a support member adapted to receive said tool holder;

slidable mounting means for mounting said tool holder and said support member;

a gimbal, having outer, middle and inner frames, on which inner frame said slidable mounting means is mounted;

a motor;

a cam shaft driven by said motor;

a plurality of cams mounted on said cam shaft;

a plurality of cam followers engaged with at least some of said cams;

a plurality of pivotal shafts connecting said cam followers to said gimbal to cause a pivotal movement of said middle and inner frames;

a housing in which said gimbal and said motor are mounted;

table means on said housing to position a semiconductor device under said bonding tool;

a source of bonding energy for said bonding tool;

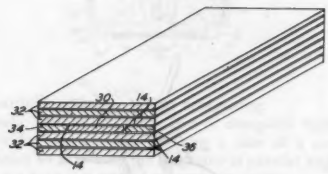
said pivotal movement of said middle and said inner frames of said gimbal causing a wobble movement of said bonding tool along a predetermined adjustable rectangular path about the periphery of one of said semiconductor devices, whereby the bonding surface of said tool sequentially and individually make a bonding contact with each of said electrical leads on each perimeter of said semiconductor devices.

3,938,723

METHOD FOR ROLLING THIN METAL FILMS

Edward R. Slaughter, 7938 Brentwood Road, Mentor, Ohio 44060

Filed Jan. 3, 1972, Ser. No. 215,044
Int. Cl.² B23K *21/00*
U.S. Cl. 228—117 **5 Claims**



1. A method of forming metal foil of a predetermined thickness t and comprising the steps of:

a. providing at least three elongated strips of said metal having a thickness T which is substantially greater than t with at least one strip being substantially less ductile than at least two other strips;

b. forming at least three sheets of said metal into a composite with at least one strip constituting an inner portion of said composite with the inner portion of said composite being substantially less ductile than the outer strips, said strips being bsnded together in face-to-face juxtaposed relationship with a layer of matrix material of a thickness substantially less than T, said matrix material being applied uniformly substantially completely across said faces to form a composite comprised of alternate layers of matrix and individual metal strips;

c. rolling said composite to reduce its thickness to a point wherein said metal strips have been reduced to a thickness *t;* and,

d. thereafter, destroying the bonds formed by said matrix material and separating said strips.

3,938,724

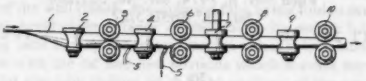
METHOD OF MAKING BUTT WELDED TUBES

Takao Nakamura, Yokohama; Itsuo Hirose, Kamakura; Rokuro Misawa, Yokohama; Hidenori Horii, Yokohama; Akira Hagio, Yokohama, and Tetsuo Sada, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 129,902, March 31, 1971, abandoned. This application June 29, 1973, Ser. No. 375,174
Int. Cl.² B23K *9/00, 9/02*
U.S. Cl. 228—147 **5 Claims**

1. In a method of making butt welded tubes of oxidizable material comprising heating a skelp to a temperature suitable for butt welding of the material, passing the heated skelp between forming rolls to form it into a tube having longitudinal edge positions bounding an open seam, and passing said open-seam tube between butt-welding rolls to cause said longitudinal edge portions to become butt welded, the improvement of blowing oxygen under pressure onto said butt welded

edge portions, whilst they are at a temperature at which oxidation will occur, thereby to cause increase of temperature of said edge portions and result in removal by oxidation and



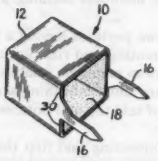
blowing away of protrusions formed during the butt welding, and whilst said butt welded edge portions are at increased temperature passing said tube through reducing rolls to produce a substantially seamless tube.

3,938,725

METHOD OF MAKING ARTICLES SUCH AS ELECTRICALLY INSULATED HOUSINGS USING STRIPED LAMINATES

John H. Hardwick; William H. Jagoe; Carl W. Tonnesen, all of Salem, and Harold W. Jesse, Amherst, all of N.H., assignors to TME Corporation, Salem, N.H.

Filed Jan. 4, 1974, Ser. No. 430,679
Int. Cl.² B63B *19/00*
U.S. Cl. 228—155 **5 Claims**



1. A method of making housings for electronic components from sheet materials comprising the steps of forming a long band composed of at least a first strip of one sheet material and a second strip of a second sheet material laminated together, each strip being of uniform length, the first strip being wider than the second strip and the second strip being positioned on the first strip such that the band has at least one first longitudinally continual zone constituted by only the first strip of material and at least one second longitudinally continual zone constituted by a laminate of both strips, and forming a succession of articles from the band by shaping and blanking the band, the shaping and blanking being controlled to locate at least one mounting lug of each housing in the first zone of the band and a cup-like body of each housing in the second zone of the band.

3,938,726

NESTING INSULATED HOT-OR-COLD FOOD TRAY

Morell J. Holden, Jr., and Frank LeBoutillier, both of Canandaigua, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed June 20, 1974, Ser. No. 481,095
Int. Cl.² B65D *1/26*; A44B *17/00*
U.S. Cl. 229—2.5 R **9 Claims**

1. Insulated hot or cold food tray for temporarily storing and transporting food items at temperatures different from ambient temperatures comprising

an integral dished tray structure of molded material having a bottom plate surface (10);

a surrounding rim (11) formed to incline upwardly with respect to the bottom plate surface;

and a flange (12) laterally projecting from the rim generally in a plane parallel to said bottom surface (10);

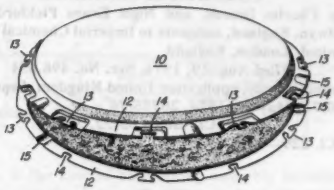
the angle of inclination of the rim being selected such that cotangent α is at least $1.5\ t/D$

wherein α equals angle of inclination; t equals wall thickness of the foamed plastic material and D equals depth of the tray structure and corresponding to the distance from the top of the flange (12) to the top of the bottom plate surface (10);

said flange (12) being formed with projection and recess means (13, 14; 23, 24) located at regularly distributed spaced intervals around the circumference thereof,

the projection means have portions which have a dimension which is greater than the dimension of the recess means (14, 24) at equal spacing from the surrounding rim (11),

inversion of one tray over another and engagement of the projection means of one tray in the recess means of the inverted, opposite tray permitting fitting of said flanges together and locking the projection means of one tray through the recess means of the other to engage the



flange of the other tray from the face opposite that facing the first tray to provide an insulated storage and transport carrier to transport food items in the chamber formed by the inverted, engaged trays with the flanges of the trays locked together by overlapping engagement of the respective projection means of one tray behind the flanges of the other tray;

wherein the projection of the projection and recess means comprises an outwardly tapering tab (13) and inwardly tapering notches (16) formed adjacent both sides of each tab and separating the tab from the surrounding flange area;

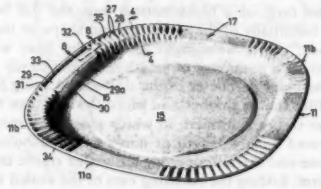
and the recess means of the projection and recess means comprises an inwardly tapering engagement notch (14), the maximum dimension of the engagement notch lying between the minimum and maximum dimension of the tab, the taper of said tab, and said engagement notches, respectively, being from about 15 mm to 18 mm, and the rim having a width (W) of about 13 mm.

3,938,727

DISPOSABLE CARDBOARD PLATES

Karl Gösta Bertil Andersson, Halmstad, Sweden, assignor to Duni Bila AB, Halmstad, Sweden

Filed Aug. 5, 1974, Ser. No. 494,974
Claims priority, application Sweden, Aug. 6, 1973, 7310754
Int. Cl.² B65D *1/42, 1/34*
U.S. Cl. 229—2.5 R **6 Claims**



1. A plate comprising a bottom defining a predetermined contour; a continuous side wall surrounding said bottom and integrally joined to said bottom along said contour, said side

wall extended upwardly from said bottom in an inclined fashion; and a brim integrally joined to and surrounding said side wall and extending generally parallel to said bottom;

said side wall and said brim being shaped along each of a plurality of spaced portions of the circumference of said plate with an origamically folded section having a plurality of alternating grooves and ridges formed in said side wall in registration with a similar plurality of alternating ridges and respectively formed in said brim;

an outer portion of said brim extending upwardly and away from said bottom and forming an end wall enclosing the outer end of each brim groove, to prevent passage of the contents of said plate therethrough when said plate is tilted to fill said brim grooves with said contents.

3,938,728
COLLAPSIBLE CONTAINER

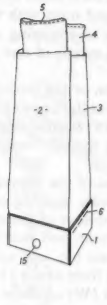
Henry Charles Deards, and Nigel Evans Pickford, both of Welwyn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 19, 1974, Ser. No. 498,851

Claims priority, application United Kingdom, Sept. 6, 1973, 41890/73; May 10, 1974, 20755/74

Int. Cl.² B65D *85/72, 5/40*

U.S. Cl. 229—14 B **1 Claim**



1. A collapsible container assembly comprising: a rectangular open-topped box; a free-standing but collapsible water-tight plastics-film sleeve fitting closely within the box at its base, the depth of the box being no more than one-half of the depth of the sleeve, the sleeve being supported within the base of the box so as to allow it to stand vertically therefrom and having the form of a block-bottom bag, the flat bottom of which is essentially of the same size and shape as the bottom of the box; and a water-tight plastics-film liner within the sleeve having a perimeter of length not significantly less than that of the inner perimeter of the sleeve, and being formed of plastics-film that is thinner and more flexible than that from which the sleeve is formed; in which the sleeve member has been formed from a length of non-gusseted tubular film by sealing one end thereof, opening the sealed sleeve into block-ended form, folding the resulting ears of the sealed end down upon a stiffening member placed against the block end, and fastening them in this position, whereby the base of the sleeve is provided with a stiffening attachment or enclosure such that the base so stiffened will fit accurately into the box member of the container assembly.

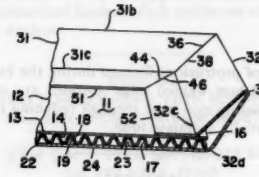
3,938,729
DISPOSABLE TRAY

Donald Ferrand Smith, Clifton, N.J., assignor to St. Regis Paper Company, New York, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,260

Int. Cl.² B65D *5/22*

U.S. Cl. 229—30 **19 Claims**



1. A tray, comprising in combination:

a top member having a first and a second side with said first side comprising a top surface of the tray;

a bottom member having a first and a second side with said second side comprising a bottom surface of the tray;

means mounting said second side of said top member to said first side of said bottom member with one of said top and bottom members extending beyond the other of said top and bottom members forming a first and a second rim portion;

each of said rim portions having a first fold line;

means for mounting said rim portions to said other of said top and bottom members establishing obtuse folds at said first fold lines and establishing acute folds located beyond said other of said top and bottom members forming a rim for the tray;

and means connecting said first rim portion to said second rim portion to secure said rim portions relative to one another.

3,938,730
FOOD CONTAINER

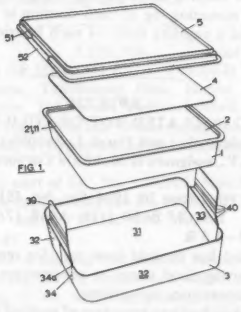
Josef Detzel, Weitnau, and Klaus Peter Bartels, Langen, both of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed July 22, 1974, Ser. No. 490,650

Claims priority, application Germany, July 21, 1973, 7326904

Int. Cl.² B65D *5/64, 5/54*

U.S. Cl. 229—43 **4 Claims**



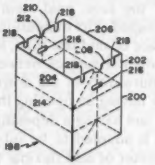
1. A container comprising a tray having side walls with a peripheral sealing flange extending around the upper edges thereof; a lid for the tray sealingly engaging the peripheral sealing flange; and, an outer protective member closely sur-

rounding the tray, the protective member having a bottom panel, upstanding wall panels with upper edges, connecting flaps folded up from the bottom panel to severably connect the wall panels together, and opening tabs formed by the portion of the connecting flaps extending beyond the upper edges of the wall panels, the opening tabs being folded around the peripheral sealing flange of the tray to lie on the lid, the opening tabs having securing portions releasably secured in position with the lid and end portions which are not secured to the lid whereby pulling on the end portions of the opening tabs will break the connection of the securing portion of the opening tabs with the lid and the connection of the connecting flaps and side wall panels and allow the protective member to fold flat.

3,938,731
RECEPTACLE FOR WASTE MATERIAL

Thorvald S. Ross, Jr., Manchester, and Leonard P. Entin, Wayland, both of Mass., assignors to Thorvald S. Ross, Jr., Beverly, Mass.

Division of Ser. No. 138,482, April 29, 1971, Pat. No. 3,779,157. This application Aug. 16, 1973, Ser. No. 388,994
Int. Cl. B65d *33/08, 5/46, 25/30*
U.S. Cl. 229—54 R **5 Claims**



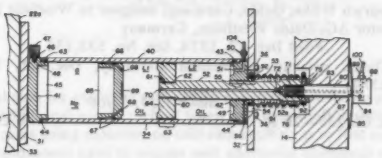
1. A rectangular container having sides, ends, a bottom, and an opening at the top, the material of the container being a foldable sheet material, the sides and ends being connected at the vertical corners of the container, each side and end comprising a foldable lower portion and a foldable upper panel portion comprising side and end panel portions, said side and end panel portions also being connected to each other along their entire vertical edges, the side panel portions being longer than the end panel portions and of such vertical width as to overlap a minimum amount and yet sufficiently to allow sealing the container when the longer side panel portions are folded toward each other into a horizontal plane; and the end panels forming upstanding triangular flaps when the side panels are in their horizontal plane, said upstanding flaps forming handles adapted to be gripped by the user of the container for carrying the latter, and are provided with hand-holes; each end panel integrally having a central section and two outer sections, the sections being integral with each other, the two outer sections being foldable to lie against the central section, the central section being provided with a hand-hole, and the upper edge of each outer section being provided with notches shaped to be complementary to at least a portion of said hand-hole when the outer sections are folded against the central section thereby to reinforce the latter.

3,938,732
ADJUSTMENT MEANS FOR ROLL CRUSHERS WITH GAS HYDRAULIC SPRINGS

Vernon L. Schrimper; Floyd A. Lillig, and Darrell J. Ulch, all of Cedar Rapids, Iowa, assignors to Iowa Manufacturing Company, Cedar Rapids, Iowa

Filed Sept. 16, 1974, Ser. No. 506,349
Int. Cl.² B02C *4/32*
U.S. Cl. 241—231 **10 Claims**

1. In a crusher of the roll type having a crushing roll mounted on and movable with respect to a crusher frame and a pair of gas hydraulic spring assemblies for maintaining the location of the roll with respect to the frame during crushing operation up to a predetermined crushing load, each spring assembly including at least one cylinder assembly comprising a cylinder closed at its opposite ends by first and second end walls, a floating piston slidably disposed in the cylinder and normally spaced from the first cylinder end wall, a compressible fluid pressurizing the space between the floating piston and the first cylinder end wall, a main piston slidably disposed between the floating piston and the second cylinder end wall and defining first and second chambers on the respective opposite ends of the main piston between the floating piston and the second cylinder end wall, a piston rod connected to the main piston having its outer end extending through and beyond the second cylinder end wall, the improvement comprising: means for adjusting the location of the movable roll relative to the frame by varying the overall length of each of the spring assemblies independently of the compressible fluid,

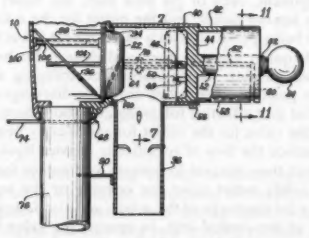


said means in the case of each spring assembly including a non-compressible fluid normally filling each of the cylinder first and second chambers, and a hydraulic system for optionally and conjointly varying the volume of the non-compressible fluid in each of the two chambers effective to cause relative movement between the main piston and the cylinder and for optionally varying the volume of the non-compressible fluid in the first chamber only effective to vary the pressure of the compressible fluid between the floating piston and the first cylinder end wall, the first cylinder end wall being operatively secured to either the adjacent end of the movable roll or the frame and the outer end of the piston rod to the other thereof so that thrust upon the roll during crusher operation is transmitted to the compressible and non-compressible fluids, the non-compressible fluid and the pressure of the compressible fluid in the spring assemblies together being effective to maintain the location of the movable roll with respect to the frame up to said predetermined crushing load.

3,938,733
SEALED COLLECTION SYSTEM

Leonard J. Weber, Broadview; George G. Dominick, Hoffman Estates, and Emad T. Moustafa, Countryside, all of Ill., assignors to Qonaar Corporation, Elk Grove Village, Ill.

Filed Jan. 14, 1975, Ser. No. 540,803
Int. Cl.² G07B *15/00*
U.S. Cl. 232—16 **13 Claims**



1. In a system for handling coins and the like including a storage housing for the coins, a door for said storage housing, a lock for said door, and a transfer mechanism for use in

removing the coins from the housing, the improvement comprising means for holding the transfer mechanism in position on the housing, said holding means comprising a pair of arms pivotally connected to said transfer mechanism, means permitting spreading of the arms for location of the arms around a housing portion, means for moving the arms together for holding engagement of the arms with the housing portion, and means for retaining the arms in said holding engagement during transfer of coins from said storage housing to said transfer mechanism, said transfer mechanism including means for operating the lock to open and to then relock the door, and wherein said arms are retained in said holding engagement until said door has been relocked.

3,938,734

CONTROLLING SYSTEM FOR THE DISPLACEMENT OF THE SPECIFICALLY LIGHTER LIQUID COMPONENTS FROM A SELF-EMPTYING SEPARATOR

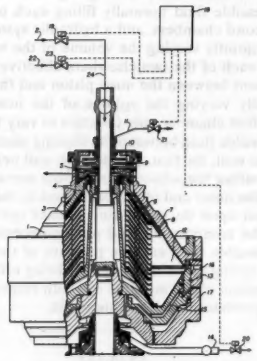
Friedrich Wilke, Oelde, Germany, assignor to Westfalia Separator AG, Oelde Westfalen, Germany

Filed Dec. 12, 1974, Ser. No. 532,134

Claims priority, application Germany, Dec. 21, 1973, 2363741

Int. Cl.[2] B04B *1/14, 11/00*

U.S. Cl. 233—20 R **4 Claims**



1. A self-emptying centrifuge suitable for separating a feed material into a specifically heavier liquid, a specifically lighter liquid, and a solids component, comprising:

a separating drum outfitted with an inlet for introduction of the feed, an outlet for specifically heavier liquid, an outlet for specifically lighter liquid, and an outlet for the solids component, each of the feed inlet, the outlet for specifically heavier liquid, and the outlet for the solids component being provided with a valve, means for actuating the solids outlet valve to open and close it for being in the closed position during normal centrifuging and in the open position when solids are to be discharged, and

a control unit effective following actuation thereof to operate the valve for the outlet for specifically heavier liquid to reduce the flow of specifically heavier liquid and after a fixed time interval to operate said means for actuating the solids outlet valve for opening of the solids outlet valve for discharge of the solids, and also following actuation of the control unit, to operate the valve in the feed line to shut off flow of feed to the centrifuge,

whereby as long as the valve in the feed line is open specifically lighter can be displaced from the centrifuge via the outlet for specifically lighter liquid before the solids component is discharged.

3,938,735

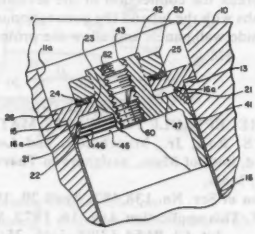
CAPPING ASSEMBLY FOR THIN ALL CENTRIFUGE TUBES

Herschel E. Wright, Santa Clara, and Kenzo Ishimaru, San Jose, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 13, 1975, Ser. No. 557,949

Int. Cl.[2] B04B *15/00*

U.S. Cl. 233—26 **4 Claims**



1. A centrifuge test tube cap for a thin flexible test tube comprising:

a stem member including a stud adapted to extend out of the mouth of the tube, said stem member including a cylindrically shaped skirt dimensioned to fit snugly within the inner surface of said test tube, said stem member also including an annular surface between said skirt and said stud slanting outwardly in the downward direction;

a crown member having an opening therein said stud of said stem member and having a depending lip, the outer diameter of which is adapted to be substantially the same as the outer diameter of said flexible test tube, said lip having a wedge-shaped cross-section with an annular inner surface slanting outwardly in the downward direction and substantially conforming with the shape and slant of said annular surface on said stem member, said wedge-shaped lip of said crown member being positioned over said stem member and being thereby adapted to cause the upper edge of said flexible tube to be deformed inward against said annular slanting surface of said stem member; and

means for clamping together said stem member and said crown member whereby said upper edge portion of said flexible tube is squeezed between said respective slanting surfaces of said stem and said crown member.

3,938,736

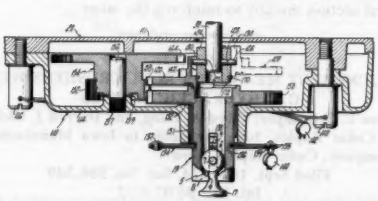
FUEL PUMP COMPUTER CONVERSION MEANS

Arthur Coleman, Dundee, Scotland, and Ronald M. Garland, Ashhurst Wood, England, assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Sept. 6, 1974, Ser. No. 503,613

Int. Cl.[2] G06C *15/42;* **B67D** *5/22*

U.S. Cl. 235—94 R **10 Claims**



1. Fuel pump computer conversion means for selectively converting the unit volume price and volume registration of a

mechanical fuel pump computer from a first to a second unit volume measure having a volumetric ratio of *a*:1; the mechanical fuel pump computer having a variator with a base and a center shaft with a portion depending below the base adapted to be rotated by a fuel meter in accordance with the volume of fuel delivered, the variator being settable for establishing each place of a unit volume fuel price within a multiple place price range and for registering the unit volume price established by the variator setting, and a resettable register having at least one volume counter connected to be driven by the variator center shaft to register the volume of fuel delivered and at least one cost counter connected to be driven by the variator to register the cost of fuel delivered in accordance with the registered volume and the unit volume price established by the variator setting; the fuel pump computer conversion means comprising an auxiliary housing mounted on the underside of the base of the variator about said depending center shaft portion, a rotary output with center shaft drive means mounted on said depending center shaft portion within the housing, a rotary input rotatably mounted on the housing to extend therethrough and having input drive means inside the housing and an outside extension adapted to be rotated by a fuel meter in accordance with the volume of fuel delivered, intermediate rotary drive means mounted within the housing for operatively connecting the rotary input drive means and the rotary output drive means; the input, output and intermediate drive means collectively providing settable drive means manually selectively shiftable from externally of the housing from a first setting establishing a first drive ratio between the rotary input and rotary output, to a second setting establishing a second drive ratio between the rotary input and rotary output, the second and first drive ratios having a relative drive ratio of *a*:1 for registering with the fuel pump computer in said first setting of the settable drive means, the unit volume price and the volume of fuel delivered in said first unit volume measure and the cost of fuel delivered in accordance with the volume and unit volume price in said first unit volume measure, and for registering with the fuel pump computer in said second setting of the settable drive means, the unit volume price and the volume of fuel delivered in said second unit volume measure and the cost of fuel delivered in accordance with the volume and unit volume price in said second unit volume measure, and means inside the auxiliary housing for preventing manually shifting the settable drive means from its said second setting to its said first setting from externally of the housing whereby a fuel pump computer converted by the conversion means is operative to be manually selectively converted once from externally of the housing, from setting a unit volume price in said first to said second unit volume measure, register the volume of fuel delivered in the respective unit volume measure, and register the cost of the fuel delivered in accordance with the registered volume and the unit volume price established by the variator setting.

3,938,737

COUNTER FOR MEASURING APPARATUS SUCH AS A WATER METER OR THE LIKE

Hans Richter, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

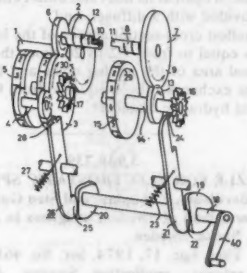
Filed Jan. 30, 1975, Ser. No. 545,555

Claims priority, application Germany, Jan. 31, 1974, 2405145

Int. Cl.² G07B *15/00*; G06C *25/02*

U.S. Cl. 235—131 R **5 Claims**

1. A counter for measuring apparatus such as a water meter or the like comprising: a first number wheel for a low decade; a drive shaft for driving said first number wheel; an additional number wheel for values of a lowest decade; clutch-coupling means for clutch coupling said additional number wheel to said drive shaft; a first alignment star corresponding to said first number wheel and an additional alignment star corresponding to said additional number wheel; and, a cam mechanism for aligning said number wheels including: a rotatable cam shaft having a first cam disc and an additional cam disc mounted thereon; a first pawl mounted so as to be actuable by said first cam for engaging said first alignment star to align said first number wheel when said cam shaft is rotated; and, an additional pawl mounted so as to be actuable by said additional cam for engaging said additional alignment star to align said additional number wheel when said cam shaft is rotated; said cams being mounted on said cam shaft so as to first cause said additional pawl to engage said additional alignment star, and then, to cause said first pawl to engage said first alignment star when said cam shaft is rotated.



3,938,738

PROCESS FOR DRAWING IN AND COMPRESSING GASES AND MIXING THE SAME WITH LIQUID MATERIAL

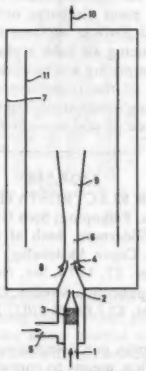
Otto Nagel; Heribert Kuerten, both of Neustadt, and Peter Zehner, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 5, 1975, Ser. No. 555,633

Claims priority, application Germany, Mar. 6, 1974, 2410570

Int. Cl.² A62C *1/12*; B05B *7/10*; E03C *1/08*

U.S. Cl. 239—9 **3 Claims**



1. A process for drawing in and compressing gases and mixing the same with liquid, comprising the steps in which

a. the gases are premixed in a mixing nozzle with one or more liquid jets traveling at a velocity of from 10 to 70 m/sec,

b. the smallest cross-sectional area of the mixing nozzle is situated from the propulsive nozzle at a distance which is equal to from 1 to 10 times the smallest hydraulic diameter of the mixing nozzle and

c. the said smallest cross-sectional area of the mixing nozzle is equal to from 1.5 to 15 times the smallest cross-sectional area of the propulsive nozzle,

d. the two-phase liquid/gas mixture emerging from this mixing nozzle is passed to the most constricted portion of an impulse exchange tube which is present in the liquid medium, is open at its inlet and outlet ends and is preferably provided with a diffuser, and

e. the smallest cross-sectional area of the impulse exchange tube is equal to from 1.2 to 20 times the smallest cross-sectional area of the mixing nozle and the length of the impulse exchange tube is equal to from 0 to 20 times the smallest hydraulic diameter.

3,938,739

NOZZLE FOR ELECTROSTATIC SPRAY GUN

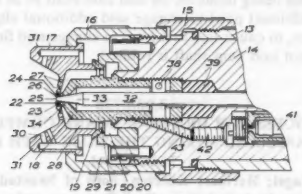
Alf Georg Bertilsson, Falkoping, and Sten Gunnar Hugo Svensson, Skara, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Apr. 17, 1974, Ser. No. 461,588

Claims priority, application Sweden, Apr. 19, 1973, 7305599

Int. Cl.² B05B *5/02*

U.S. Cl. 239—15 **20 Claims**



1. Electrostatic spray gun comprising a paint nozzle with a paint discharge orifice, means to convey paint to the paint nozzle, and means coupling high voltage to the paint nozzle, said nozzle comprising a body consisting essentially of a non-conductive matrix and a large number of electrically conductive particles dispersed therein, said body having an annular surface around the paint discharge orifice which includes a plurality of exposed particle surfaces forming a plurality of electrodes for producing air ions, a plurality of said exposed particle surfaces comprising a substantial portion of the maximum cross-section of the respective particle, the exposed particle surfaces being substantially coplanar with the immediately adjacent surface of said non-conductive matrix.

3,938,740

NOZZLE FOR ELECTROSTATIC SPRAY GUN

Alf Georg Bertilsson, Falkoping; Sten Gunnar Hugo Svensson, and Claes Erik Söderman, both of Skara, all of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Apr. 17, 1974, Ser. No. 461,589

Claims priority, application Sweden, Oct. 4, 1973, 7313505

Int. Cl.² B05B *5/02, 7/04*

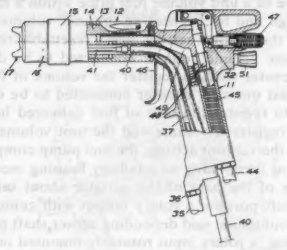
U.S. Cl. 239—15 **31 Claims**

1. Electrostatic spray gun comprising a paint nozzle with a paint discharge orifice, means to convey paint to said orifice, and means coupling high voltage to said nozzle, said nozzle comprising:

a non-conductive first body and a second body at least partly covered by said first body, said second body consisting essentially of a non-conductive matrix and a large number of electrically conductive particles dispersed therein, said discharge orifice being an orifice in said second body;

said high voltage being coupled to said second body of said nozzle; and

said second body having an annular surface around the paint discharge orifice which includes a plurality of exposed particle surfaces forming a plurality of electrodes for producing air ions, a plurality of said exposed particle



surfaces comprising a substantial portion of the maximum cross-section of the respective particle, the exposed particle surfaces being substantially coplanar with the immediately adjacent surface of said non-conductive matrix.

3,938,741

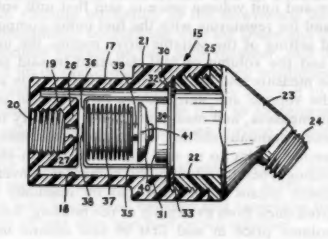
SHOWER HEADS

Lawrence McFarland Allison, Louisville, Ky., assignor to Apor Industries, Inc., Chattanooga, Tenn.

Filed Nov. 18, 1974, Ser. No. 524,738

Int. Cl.² B05B *12/10*

U.S. Cl. 239—75 **4 Claims**

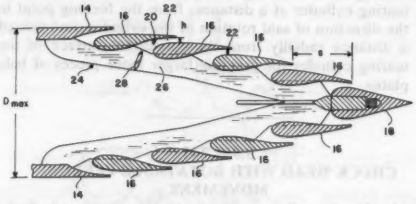


1. A bathing fixture comprising a housing having a water supply inlet communicating with a chamber therein, a valve seat providing an outlet opening for said chamber, a discharge nozzle connected to said housing and in communication with the outlet opening formed by said valve seat, temperature responsive power means located in said chamber, a valve member connected to said power means for movement thereby upon an increase in temperature of the water flowing through said chamber above a given operating temperature, and means in said chamber supporting said power means to enable the latter to move said valve member toward said valve seat to close the opening therethrough when the temperature of the water in said chamber reaches said given operating temperature, one end of said housing being provided with a nipple for connecting a water supply pipe to said housing and forming said water supply inlet, said nipple and said valve seat having a common central axis, and said supporting means supporting said power means between said nipple and said valve seat with one end of said power means fixed in said chamber at a place adjacent to the discharge end of said nipple, said valve member being connected to the other end of said power means and movable along said common central axis toward said valve seat.

3,938,742
CASCADE PLUG NOZZLE

Blake W. Corson, Jr., Newport News, Va., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Continuation of Ser. No. 331,759, Feb. 13, 1973, abandoned.
This application July 12, 1974, Ser. No. 488,616
Int. Cl.² B63H *11/00*
U.S. Cl. 239—265.11 10 Claims



1. A low drag exhaust nozzle for a jet aircraft which provides jet noise suppression comprising a plurality of coaxial annular segment means for sequencing the exit of exhaust gas sound wave pressure perturbations, enveloping the majority of exhaust gases in a thin exhaust gas jet layer, and converting the kinetic energy of the exhaust jet into a forward, drag-reducing thrust component, wherein said coaxial annular segments are spaced serially along the longitudinal axis of the nozzle, the diameters of said annular segments progressively decreasing downstream along said axis so that each segment is smaller in diameter than the preceding upstream segment and is larger in diameter than the subsequent downstream segment, each of said annular segments overlapping both the preceding upstream annular segment and the subsequent downstream annular segment for overlapping lengths which are small compared to the axial length of said annular segments, and said overlapping lengths defining a plurality of coaxial channels therebetween having noncoplanar exits, the length of each of said channels being small compared with the axial length of said annular segments defining said channels and the radial depth of at least the first, most upstream channel being small compared with the axial distance between the exits of said first channel and the next downstream channel and the boattail angle between the external surface of the most upstream annular segment and the longitudinal axis of the nozzle is less than 10°.

3,938,743
ADJUSTABLY POSITIONABLE SUPERSONIC NOZZLE MEANS

A. Leslie Miller, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

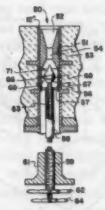
Filed June 26, 1974, Ser. No. 483,236
Int. Cl.² B05B *1/32, 1/30*
U.S. Cl. 239—457 1 Claim

1. Apparatus for use in a tuyere or like tubular member to impart supersonic velocity to a fluid passing therethrough, said apparatus comprising:

nozzle means including a central member axially positionable within a tubular member, said central member having a convergent portion, a divergent portion, and a neck portion between said divergent and convergent portions to define an annular passageway between said neck portion and tubular member having a restricted flow area to said fluid;

a venturi member having an axially convergent portion, an axially divergent portion, and a neck portion positioned between said convergent and divergent portions of said venturi member; said central member having its convergent portion of a shape substantially conforming to the convergent portion of said venturi member and being axially positionable with respect to said convergent portion of said venturi member;

a first adjusting means operably connected to said venturi member and central member for axially positioning said members along said tubular member; and

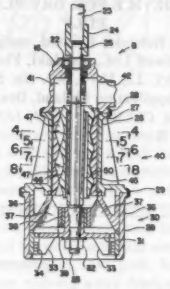


a second adjusting means operably connected to said central member for positioning said central member relative to said venturi member.

3,938,744
POSITIVE DISPLACEMENT ROTARY PUMP AND DRIVE COUPLING THEREFOR

Clifford Harry Allen, 13109 Westchester Trail, Chesterland, Ohio 44026

Filed Sept. 5, 1974, Ser. No. 503,380
Int. Cl.² B02C *18/40;* F01C *5/04;* F04C *15/00*
U.S. Cl. 241—46.11 10 Claims



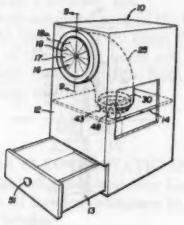
3. In a progressing-cavity, positive displacement rotary pump assembly including a rotary shaft and drive means therefor, a generally tubular stator coaxial with said rotary shaft and having a helically formed interior surface, a rotor located within said stator and having a helically formed exterior surface engaging said interior surface of said stator to define therewith sealed pumping cavities, the improvement which comprises:

a flexible member for coupling said rotor to said shaft, one end of said member being rigidly connected to said shaft and the other end thereof being rigidly connected to said rotor to transmit driving torque to said rotor and to flex to accommodate orbital movement of said rotor during rotation thereof.

3,938,745
BOTTLE CRUSHER

Floyd R. Gladwin, P.O. Box 1113, Southgate, Mich. 48192

Filed Oct. 10, 1974, Ser. No. 513,698
Int. Cl.² B02C *13/18, 19/12*
U.S. Cl. 241—99 12 Claims



6. A glass article breaker comprising:

a rotatable flat disk-like plate having a short and a long narrow radially directed vane formed upon its upper surface;

with the upper edge of each vane being sloped upwardly from the center of the plate towards the plate outer edge, and terminating in a small area high point, but with the slope of the short vane being greater than and its high point being higher than that of the long vane;

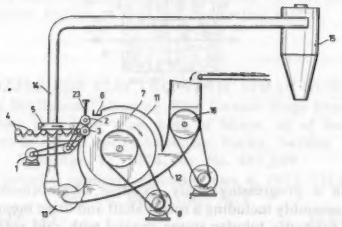
a chute arranged above the plate for directing glass articles, such as bottles and the like for gravity dropping upon the plate and vane high points for initially breaking the glass;

and means for rotating the plate, wherein said vanes repeatedly impact the glass and the sloped upper edges of the vanes throw the glass upwardly for gravity dropping back down upon the plate and vanes.

3,938,746
PRE-TEARING DEVICE FOR DRY PLATES OF WOOD PULP

Gunnar Nordgren, Helsinki, Finland, assignor to Oy Suomen Vanutehdas - Finwad Ltd., Helsinki, Finland

Filed Oct. 22, 1974, Ser. No. 516,927
Claims priority, application Finland, Dec. 21, 1973, 3956/73
Int. Cl.² B02C *18/14, 18/22*
U.S. Cl. 241—186 R 6 Claims



1. A pre-tearing device for producing a coarse flour from bale plates of flake-dried wood pulp, comprising:

a. a tearing cylinder arranged for rotation about an axis of rotation;

b. a plurality of spikes arranged on the cylindrical surface of the tearing cylinder as two helices extending in opposite directions in relation to each other, the distance between adjacent spikes of each helix being in the axial direction of the tearing cylinder, several times bigger than the width of each spike;

c. a plurality of bands extending circumferentially around the cylinder in a parallel relationship with each other, the distance between adjacent bands, in the axial direction of the tearing cylinder, being several times bigger than the width of each band;

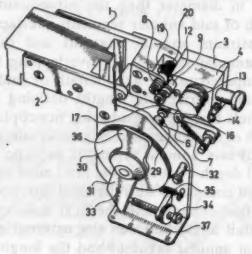
d. means for feeding the bale plates to the rotating cylinder such that the angle between the feeding direction of the plates and the radius of the cylinder, at the point where the front end of the plates engages the cylindrical surface of the tearing cylinder, is in the range of 15 to 35°; and

e. a wedge means arranged in parallel with the axis of the tearing cylinder at a distance, from the feeding point in the direction of said rotation of the cylinder, and spaced a distance radially from the cylindrical surface of the tearing cylinder for grinding larger loose pieces of bale plates.

3,938,747
CHUCK HEAD WITH ROTATABLE FEEDING MOVEMENT

Bohuslav Vavrinec, Prague, Czechoslovakia, assignor to Tesla, narodni podnik, Prague, Czechoslovakia

Filed Feb. 22, 1974, Ser. No. 444,844
Claims priority, application Czechoslovakia, Mar. 9, 1973, PB1728-73
Int. Cl.² H01F *41/08*
U.S. Cl. 242—4 C 6 Claims



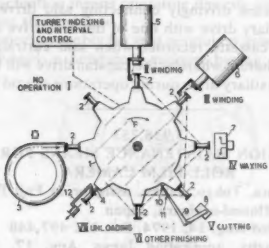
1. A chuck for winding a conductor wire into a toroid comprising a frame having a base wall and a spaced front plate parallel therewith, a front shaft and a rear shaft rotatably journalled within said base wall and front plate, a rotatable core on which said wire is wound into a toroid, said core being located between said front and rear shafts, a first and second toroid clamping rollers mounted respectively on each of said front and rear shafts, said first and second toroid clamping rollers being adapted to engage therebetween the wire toroidally wound on said core, a supporting shaft rotatably journalled between the base wall and the front plate spaced from and parallel with the front and rear shaft, a bracket pivotally supported by said supporting shaft, a lateral shaft journalled on said bracket, a third clamping roller mounted on said lateral shaft, said lateral shaft being positioned on said bracket to move toward and away from said frame on pivoting said bracket, so that said third supporting roller is adapted to selectively engage the surface of said wire wound on said core, and spring means for normally biasing said bracket toward said frame, transmission means for simultaneously rotating the front, rear and lateral shafts at a uniform speed and in the direction of rotation of said core, so that said clamping rollers cooperate to rotate the wire wound on said core, and motor means for driving said gear means.

3,938,748

MACHINE TOOL WITH INTERMITTENTLY ROTATABLE TURRET, MORE PARTICULARLY A COIL WINDER, AND METHOD OF OPERATING SAME

Giuseppe Camardella, No. 1, Via E. Biondi, 20154 Milan, Italy
Continuation of Ser. No. 15,808, March 2, 1970, abandoned.

This application Mar. 13, 1974, Ser. No. 450,916
Int. Cl.[2] H01F 11/04
U.S. Cl. 242—7.09 4 Claims



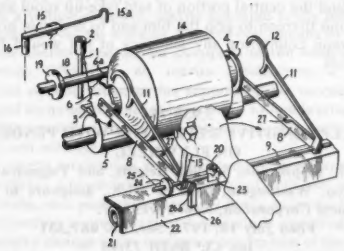
1. A method of performing a plurality of working operations on successive workpieces, the method including loading on a feed support the workpieces to be processed, and advancing the feed support by steps to convey the workpieces through a series of working stations, said working operations including a basic working operation requiring a relatively long time, and a plurality of complementary working operations each requiring a relatively short time, characterized in carrying out said basic working operation on *n* parts simultaneously at *n* working stations, *n* being at least 2, carrying out said complementary working operations in succession on single workpieces at single working stations, and advancing said feed support at the end of each basic working operation by *n* steps of which the last step is followed by a long stop for carrying out the next basic working operation and a complementary working operation, and the other steps are followed by short stops for carrying out only complementary working operations.

3,938,749

DEVICE FOR DOFFING A FULL BOBBIN ON A TEXTILE MACHINE

Jean Gleyze, St. Pierre de Colombier, France, assignor to Societe Civile Textile dite Societex, Lyon, France

Filed May 20, 1974, Ser. No. 471,974
Claims priority, application France, May 21, 1973, 73.18446
Int. Cl.[2] B65H 67/04
U.S. Cl. 242—18 PW 10 Claims



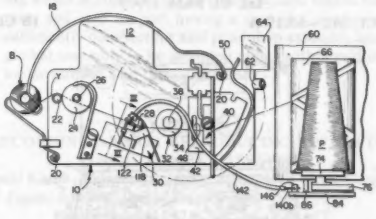
1. In an device on a textile machine for changing bobbins and loading empty bobbin tubes for winding yarn thereon, a combination comprising means for releasably supporting an empty bobbin tube on opposite ends turnable about its axis, said means comprising a pair of spaced substantially parallel arms having each at one end tube engaging means adapted to engage a tube at a respective one of opposite ends, said arms being in the region of the other ends thereof connected to each other for simultaneous pivoting movement about a pivot axis substantially parallel to the axis of a tube so mounted, between a first yarn winding position and a second releasing position; means connected to said bobbin tube supporting means for pivoting the same between said positions thereof; means for moving at least said one end of at least one of said arms away from the other arm as the bobbin tube supporting means approaches said releasing position to release the bobbin tube from said engaging means; a cradle pivotable about said pivot axis; and means on said arms of said bobbin tube supporting means for engaging said cradle during pivoting of said bobbin tube supporting means from said first to said second position for moving said cradle to a corresponding second position for receiving a full bobbin upon release of the bobbin tube from said bobbin tube engaging means, said cradle engaging means being arranged so that the cradle may stay in said corresponding second position when said bobbin supporting means is returned to said first position.

3,938,750

STRAND DELAY DEVICE

Porter I. Barnes, Johnston, and Carlton A. Steele, Warwick, both of R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Sept. 5, 1974, Ser. No. 503,496
Int. Cl.[2] B65H 63/00, 54/22
U.S. Cl. 242—36 8 Claims



1. In a strand detection system having a fault sensing zone operable to receive a strand and detect faults therein as the strand moves through said zone, the combination therewith of strand retaining means movable in a path between a first location for retaining said strand against entry into said zone and a second location remote from said first location where said strand is released for entry into said zone, securing means adapted to be positioned in said path for preventing said retaining means from moving away from said first location, and means for displacing said securing means from said path to permit said retaining means to move to said second position and afford passage of said strand into said zone.

3,938,751

DEVICE FOR CONTINUOUSLY TREATING WIRES

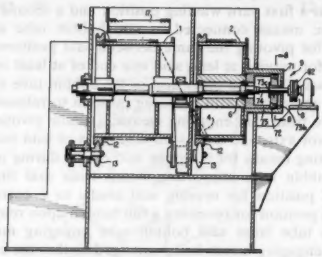
Heijiro Kawakami, Kobe, and Yasunobu Kawaguchi, Takarazuka, Hazine Fukinbara, Kobe, all of Japan

Filed Dec. 21, 1973, Ser. No. 427,238
Int. Cl.[2] B65H 51/20
U.S. Cl. 242—47.01 10 Claims

1. A device for continuously treating wire comprising:
a first freely rotatable drum for winding said wire thereon;
a second drum for winding said wire thereon being freely rotatable independently of said first drum;
means for rotating the first and second drums relative to each other;

means for guiding a portion of said wire stretched between said first and second drums;

means for detecting the slackening of said wire portion stretched between said first and second drums;



means responsive to said detecting means for adjusting the slackening of said wire portion stretched between said first and second drums; and

means for controlling the relative rotations of said first and second drums.

3,938,752

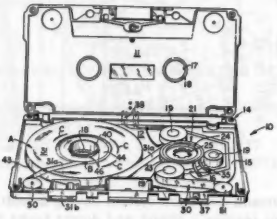
AUXILIARY DRIVE ENDLESS LOOP TAPE CARTRIDGE

Donald V. Mann, 4620 Geary Blvd., and Herman C. Mann, 426 Oxford St., both of San Francisco, Calif. 94118

Continuation of Ser. No. 880,201, Nov. 26, 1969, abandoned. This application Oct. 19, 1973, Ser. No. 408,143

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.19 A **18 Claims**



1. An endless loop magnetic tape cartridge for commercially available standard cassette recorders having two spaced reel drive shafts comprising:

a hollow rectangular cartridge case, said case having two spaced reel drive shaft apertures and a capstan drive aperture for cooperating with the mechanical drives of a standard cassette recorder;

a flat circular tape platen having a conical tape hub concentrically attached thereto and a flat tape supporting surface, said tape hub mounted inside said hollow rectangular case over a first reel drive shaft aperture;

an endless spool of magnetic tape spirally coiled on a surface of said flat circular tape platen with its innermost convolution contiguous to said conical tape hub, said endless spool having a threading loop egressing from its innermost convolution and returning to its outermost convolution;

guide means mounted within said case operably supporting said threading loop therein for engagement with a capstan drive and magnetic responsive means of a standard cassette recorder when said hollow cassette case is inserted therein;

an auxiliary drive means journalled inside said hollow rectangular case over a second reel drive shaft aperture, said auxiliary drive means having a flat floating plate with a central circular aperture mounted generally concentrically with said second reel drive shaft aperture, a drive wheel mounted over said second reel drive shaft aperture and a plurality of tape guides mounted on said floating plate and circumferentially disposed in spaced relationship about said drive wheel operable to support a portion of said threading loop about a substantial portion of said drive wheel to achieve positive driving engagement therebetween while allowing said drive wheel and said floating plate to move in unison within said rectangular case; and

coupling means drivingly connecting said drive wheel of said auxiliary drive with one of the reel drive shafts of a standard cassette recorder when said cartridge case is inserted therein whereby the capstan drive will be assisted by said auxiliary drive during operations of said recorder.

3,938,753

FILM TENSION MAINTENANCE MEANS FOR USE IN ROLL-FILM CAMERA

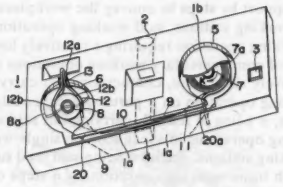
Shigeru Oshima, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 14, 1974, Ser. No. 497,448

Claims priority, application Japan, Aug. 17, 1973, 48-96543[U]

Int. Cl.² B65H *77/00*

U.S. Cl. 242—71.2 **1 Claim**



1. In a camera including a camera body, a feed spool and a take-up spool rotatably mounted within said camera body, a film loaded on said feed spool and being steadily wound from said feed spool onto said take-up spool for exposure of successive film frames through a camera lens, the improvement comprising:

an expandable clasp element for tensioning said film, said element including a base portion and a pair of arms, said element being formed by a strip of tensile material bent into caliper shape to form said base portion and said two arms which extend from said base portion and tend to close towards one another,

said camera body being provided with a slot to the side of said take-up spool, said slot receiving said base portion with said arms extending from said slot and being fitted around the central portion of said take-up spool and film wound thereon to grip the film and to maintain pressure thereon countering any tendency of the wound film to uncoil.

3,938,754

VEHICLE SENSITIVE RETRACTOR WITH PENDULUM ON FLYWHEEL

Robert L. Stephenson, Sterling Heights, and Yogendra Singh Loomba, Washington, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

Filed July 10, 1974, Ser. No. 487,331

Int. Cl.² B65H *75/48*

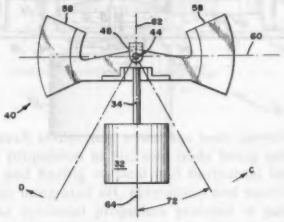
U.S. Cl. 242—107.4 A **6 Claims**

1. In a vehicle-sensitive, inertia operated safety belt retractor having a reel for winding a safety belt, means to lock the reel and thereby restrain an occupant of the vehicle during dangerous situations, a support structure which includes two

side walls and a back wall, an inertia mechanism, a support assembly mounted on said retractor for supporting the inertia mechanism and an actuating means responsive to said inertia mechanism for operating the means for locking the reel; the improvement wherein:

said inertia mechanism is a pendulum assembly which includes a pendulum head in contact with said actuating means, said pendulum assembly being actuated by forces exceeding a predetermined magnitude resulting from a sudden change in the motion or orientation of the vehicle, said actuation means operating directly on the means for locking the reel; and

said support assembly for said pendulum assembly includes: a flywheel; a pendulum support having a substantially



circular support edge upon which said pendulum head is disposed, said pendulum assembly requiring a force exceeding a predetermined magnitude to lift a part of the pendulum head up and off a part of said support edge before said pendulum assembly will cause said locking means to lock the reel; said pendulum support being mounted on said flywheel, said flywheel and said pendulum assembly being adapted to pivot in one plane to a variety of operable static positions to which said pendulum assembly is adjustable according to the position in which the retractor is oriented by virtue of installation in the vehicle; an axle for said flywheel adapted to allow said flywheel to pivot in one plane; and a flywheel support for said flywheel and said flywheel axle, said flywheel support being mounted on said retractor.

3,938,755

VEHICLE SENSITIVE RETRACTOR WITH ENCLOSED DOUBLE PENDULUM

Robert L. Stephenson, Sterling Heights; Robert C. Pfeiffer, Rochester, and Yogendra Singh Loomba, Washington, all of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

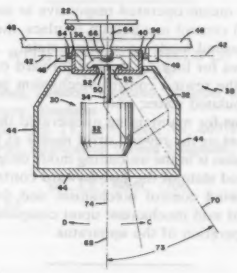
Filed July 10, 1974, Ser. No. 487,330
Int. Cl.² B65H *75/48*
U.S. Cl. 242—107.4 A **6 Claims**

1. In a vehicle-sensitive, inertia operated safety belt retractor having a reel for winding a safety belt, means to lock the reel and thereby restrain an occupant of the vehicle during dangerous situations, an inertia mechanism, a support mounted on said retractor for supporting the inertia mechanism and an actuating means responsive to said inertia mechanism for operating the means for locking the reel; the improvement wherein:

said inertia mechanism is a lower pendulum assembly which includes a pendulum head in contact with said actuating means, said pendulum assembly being actuated by forces exceeding a predetermined magnitude resulting from a sudden change in the motion or orientation of the vehicle, said actuation means operating directly on the means for locking the reel without any intermediate mechanism disposed structurally or operatively between said actuating means and said means for locking the reel; and

said support for said lower pendulum assembly is an upper pendulum assembly which includes: a trunnion which is a concave vessel having a substantially circular support edge upon which said pendulum head is disposed, said lower pendulum assembly being adapted to pivot upon said support edge in any lateral directions, said pendulum assembly requiring a force exceeding a predetermined magnitude to lift a part of the pendulum head up and off a part of said support edge before said lower pendulum assembly will cause said locking means to lock the reel;

said upper pendulum assembly being adjustable to a variety of operable static positions in one plane with reference to



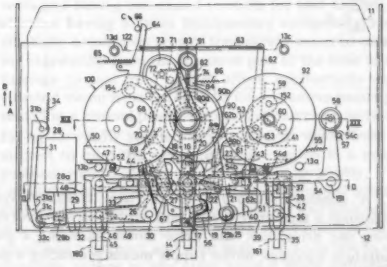
said retractor according to the position in which the retractor is oriented by virtue of installation in the vehicle; a swivel axis for said trunnion adapted to allow said trunnion to pivot in two lateral directions in one plane; a support member for said trunnion; and a pendulum housing which is attached to the trunnion; said inertia mechanism and said support having a compact configuration, sufficiently compact for said pendulum assembly and said gimbal assembly to be mounted either within said retractor or outside said retractor.

3,938,756

RECORDING AND/OR REPRODUCING APPARATUS USING A TAPE CASSETTE

Hiroshi Katoh, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed May 24, 1974, Ser. No. 473,177
Claims priority, application Japan, May 25, 1973, 48-57667; June 12, 1973, 48-66201; June 14, 1973, 48-66338; June 14, 1973, 48-66339; June 12, 1973, 48-66200
Int. Cl.² B65H *59/38;* **G03B** *1/04;* **G11B** *1/52, 15/06*
U.S. Cl. 242—188 **9 Claims**



1. A recording and/or reproducing apparatus of the type using a tape cassette containing a recording tape therewithin, said apparatus comprising:

means for drawing the tape out of the cassette and placing the tape in a predetermined tape level path at the time of loading the apparatus and for replacing the tape in the

tape travel path back into the cassette at the time of unloading the apparatus;

a fast-forward operation mechanism for placing the apparatus in a fast-forward mode responsive to controllable manipulation;

fast-forward drive means operated responsive to the fast-forward control mechanism being thus manipulated to place the apparatus in the fast-forward mode operational state;

a rewind operation mechanism for placing the apparatus in a tape rewind mode responsive to controllable manipulation;

rewind drive means operated responsive to manipulation of the rewind control mechanism to place the apparatus in the tape rewind mode operational state;

locking means for locking the fast-forward control mechanism and the rewind control mechanism in their respective manipulated states; and

control means for maintaining unoperated the fast-forward drive means or the rewind drive means at the time when the apparatus is in the unloading mode despite the locked manipulated state of the fast-forward control mechanism or the rewind control mechanism and for maintaining unoperated said mechanism upon completion of the unloading operation of the apparatus.

3,938,757

TAPE TRANSPORT SYSTEM INCLUDING A LOGICAL NETWORK FOR PRODUCING QUADRATURE PULSE TRAINS AND MOTOR CONTROL UTILIZING SAME

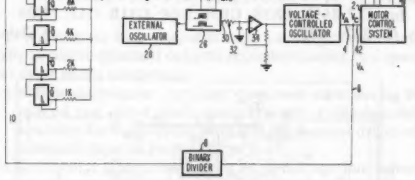
John E. Sargunar, Glenrothes, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 29, 1974, Ser. No. 456,239

Claims priority, application United Kingdom, May 2, 1973, 20840/73

Int. Cl.² B65H *59/38*; G03B *1/04*; G11B *15/32*

U.S. Cl. 242—186 **7 Claims**



1. A constant speed reel-to-reel tape transport system, comprising: a tape drive reel; a tape supply reel; a drive motor driving the drive reel; said drive motor including a pair of quadrature windings; motor supply means producing a pair of square-wave motor-drive pulse trains of the same repetition rate, but 90° out of phase, and supplying one train to each of the quadrature windings of the drive motor to control its speed in accordance with the repetition rate of the pulse trains; and control means responsive to the change in the effective radius of one of said reels for varying the repetition rate of said pulse trains, and thereby the speed of the motor, to maintain a constant linear tape speed.

3,938,758

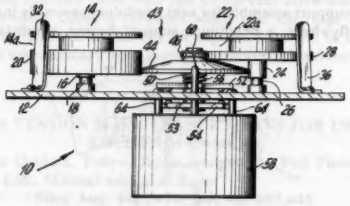
SIMPLIFIED TAPE DRIVE

Peter J. Totino, West New York, N.J., assignor to Quasar Microsystems, Inc., Brentwood, N.Y.

Filed Nov. 15, 1973, Ser. No. 415,953

Int. Cl.² G03B *1/04*; G11B *15/32*

U.S. Cl. 242—201 **13 Claims**



1. A tape drive comprising a supply reel and a take-up reel, said supply reel being provided with a wide rim and said take-up reel being provided with a narrow rim, a portion of said supply reel rim extending below said take-up reel rim, said reels being rotatably mounted on a deck, a magnetic head being positioned in a path of tape moving from one to the other of said reels, drive means for advancing and rewinding said tape, said drive means including a platform disposed between said reels, means pivotally mounting said platform on said deck for free pivotal movement in a plane between first and second positions, said platform including a planar plate provided with spaced protuberances distributed about a periphery of one surface of said planar plate, said protuberances abutting against said deck to permit said planar plate to slidably move relative to said deck, a shaft projecting from said plate and being oriented in a direction substantially normal to said plane, a drive disc rotatably mounted on said shaft with said drive disc being movable with said plate about a pivot point of said plate between said first and second positions, friction means disposed between said drive disc and said plate for transmitting rotational forces to said plate in response to rotary movement of said drive disc on said shaft, said friction means including a helical spring mounted concentrically on said shaft with opposing free ends of said spring frictionally abutting against said drive disc and said plate, a motor shaft frictionally engaging a periphery of said drive disc for rotating said drive disc, biasing means connected to said plate for urging said plate in direction of said motor shaft to insure frictional engagement between said drive disc and said motor shaft, said drive disc including coaxial smaller and larger diameter discs vertically spaced from one another along axes thereof and fixed to one another for simultaneous rotation, said larger diameter disc being disposed at a low level to be engageable only with said supply reel rim, said smaller diameter disc being disposed at a higher level to be engageable only with said take-up reel rim, positions of said drive disc with respect to said pivot point of said platform being determined by direction of rotation of said motor shaft, said drive disc moving to said first position to engage said large diameter disc with said supply reel rim for turning said supply reel when said motor shaft turns in one direction, and said drive disc moving to said second position to engage said smaller diameter disc with said take-up reel rim for turning said take-up reel when said motor shaft turns in an opposite direction, whereby rewinding said tape by turning said supply reel is at a higher speed than advancing said tape by turning said take-up reel.

3,938,759

SPECIAL AIRCRAFT USING A NOVEL INTEGRATED LIFT, PROPULSION AND STEERING SYSTEM

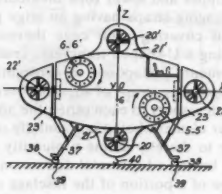
Paul Bastide, 108, rue de Rennes, 75006-Paris, France

Division of Ser. No. 354,797, April 26, 1973, abandoned. This application Aug. 19, 1974, Ser. No. 498,873

Claims priority, application France, Apr. 26, 1972, 72.14768

Int. Cl.² B64C 39/00

U.S. Cl. 244—9 10 Claims



10. An aircraft comprising a fuselage body constructed and arranged for propulsion in air, said body being substantially symmetrical and having vertical and horizontal longitudinal planes, and an integrated lift, propulsion and steering system including four cycloidal propellers grouped in pair on said fuselage body, one pair at the front and one pair at the rear of the body, each cycloidal propeller having a horizontal axis of rotation and comprising a flat ring having a horizontal axis, a circular array of identical horizontal blades, each free to turn about an axis perpendicular to said ring, said blades being supported from said ring at the periphery thereof, connecting-grods extending parallel to the plane of said ring and coupled to the blades for turning the same to vary the angle of net thrust produced by the blades, a common control head coupled to said connecting rods to operate the same and which may be eccentrically adjusted with respect to the axis of rotation of said propeller to vary the angle of thrust produced by said propeller within a vertical plane, and a hollow drive shaft for driving each propeller, said control head including means for swivelling the connecting-rods of the propeller, comprising a control lever passing inside said hollow shaft, a central swivel joint for said control lever which is stationary, two movable swivel joints at the end of the lever and two stationary hydraulic cylinders disposed at 90° with respect to each other coupled to the inner of the movable swivel joints.

3,938,760

AIRCRAFT FOR SHORT LANDING AND TAKEOFF DISTANCE

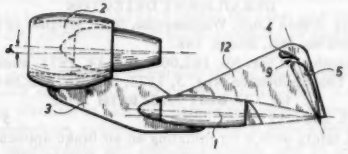
Heinzjochen Höppner, Neukeferloh, and Hans-Jurgen Schwärzler, Munich, both of Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed Sept. 27, 1972, Ser. No. 292,636

Claims priority, application Germany, Oct. 5, 1971, 2149590

Int. Cl.² B64C 15/06

U.S. Cl. 244—12 D 4 Claims



1. In an airplane, the improvement for obtaining short take-off and landing distance, comprising the combination of a jet flow emitting engine mounted on the upper side of a wing of the aircraft and in forward position so that the jet as rearwardly directed by the engine passes over and above the wing; and

the wing being constructed to have flap means in the rear of the engine, the flap means being pivotable on an axis adjacent the trailing edge of the wing so that the front portion of the flap means swings up for being positionable in the range of the jet flow of the engine to obtain jet deflection in down direction along the lower side of the swung up flap means.

3,938,761

AIRCRAFT WITH IMPROVED FIELD OF VIEW FOR PASSENGERS

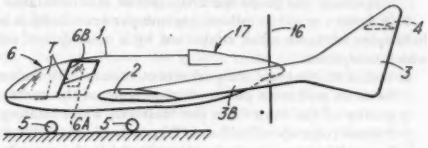
John Hempenstall, London, England, assignor to Scenic Flying Limited, Surrey, England

Filed Oct. 17, 1973, Ser. No. 407,133

Claims priority, application United Kingdom, Oct. 23, 1972, 48749/72

Int. Cl.² B64C 1/00

U.S. Cl. 244—13 8 Claims



1. An aircraft with an improved field of view comprising:

a fuselage,

thrust producing means,

lift surfaces including a mainplane attached to said fuselage, and

a cabin within and extending to and constituting the nose of said fuselage, the cabin enclosing seated accommodation for a plurality of passengers and for a pilot,

said passenger accommodation comprising a plurality of passenger seats,

said pilot accommodation comprising a pilot seat disposed behind and at a higher seating level than said passenger seats and having associated controls for said aircraft,

said cabin having a cabin transparency comprising a substantially continuous area of transparent material extending rearwardly from the foremost part of the nose of said fuselage to said pilot seat to afford substantially unobstructed vision from the aircraft for respective passengers seated in a normal position upon said passenger seats and facing forwardly and to afford sufficient vision from the aircraft to pilot the same for a pilot seated in a normal position upon said pilot seat and facing forwardly,

all of said thrust producing means being disposed substantially entirely behind all of said passenger and pilot seats,

said mainplane being disposed substantially entirely behind all of said passenger and pilot seats and so as not to substantially reduce in any other normal flight attitudes of the aircraft that view of the ground which is afforded from the aircraft in straight and level flight for passengers and a pilot respectively seated in a normal position upon said passenger and pilot seats and facing forwardly, and

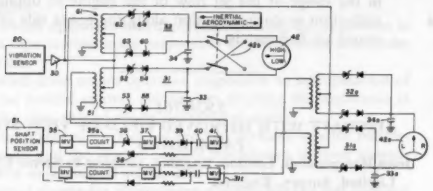
said mainplane being selected to be efficient at airspeeds compatible with safe low flying for sightseeing or observation purposes.

3,938,762

ROTOR BLADE FORCE TRACK SENSING SYSTEM AND AUTOMATIC SPAN TRACKING SYSTEM

Milford R. Murphy, Arlington, Tex., assignor to Textron, Inc., Providence, R.I.

Filed May 20, 1974, Ser. No. 471,177
Int. Cl.² B64C *11/44*
U.S. Cl. 244—17.13 **23 Claims**



1. The method of minimizing one-per-rev vibration in a helicopter due to rotor unbalance which comprises:

generating a one-per-rev vibration signal for at least two blades of the rotor as a manifestation of rotor unbalance,

sampling said signals when each of the rotor blades are successively in alignment with a reference direction during each cycle of rotation of said rotor, and

generating a difference signal by comparing samples of said signals from each of the rotor blades to represent by magnitude and phase the character of said unbalance.

9. A system to aid in minimizing one-per-rev vibration in a helicopter airframe when supported by a mast driven rotor which comprises:

a. means to generate a signal representative of unbalance force on said mast due to displacement of the center of gravity of the rotor from the mast axis when rotating at normal rotor speed and zero lift, whereby the rotor may be modified in magnitude proportional to the magnitude of said signal and in direction dependent upon the span and chord components of said signal, and

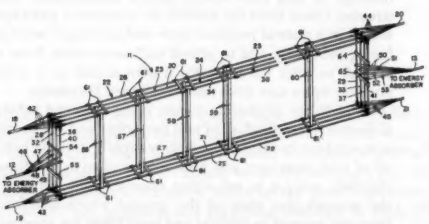
b. means to generate a signal representative in phase and magnitude of unbalance moments on said mast due to aerodynamic forces on said mast when hovering said helicopter at normal rotor speed whereby the aerodynamics of said rotor may be modified in magnitude proportional to the magnitude of said signal and direction dependent upon said components of said signal.

3,938,763

SPACE SHUTTLE ORBITER BARRICADE

Perry R. DiGiovanniantonio, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 23, 1974, Ser. No. 472,559
Int. Cl.² B64F *1/02*
U.S. Cl. 244—110 C **2 Claims**



1. An arresting barrier for arresting aircraft having a fuselage and wings of predetermined size, comprising:

a plurality of barrier elements;

each of said barrier elements including vertically spaced horizontally disposed upper and lower rope members and horizontally spaced vertically disposed left and right rope members, wherein each end of each rope member terminates in an integral loop and the loops of said upper and lower rope members are interlinked with corresponding loops of said left and right rope members;

each of said barrier elements further including a plurality of horizontally spaced vertically disposed engaging straps each strap having two end portions respectively encircling said upper and lower vertically spaced horizontally disposed rope members to thereby slidably attach said strap to said upper and lower rope members;

each of said engaging straps having an edge protector attached to and covering each edge thereof, said edge protector having a U-shaped transverse cross section;

said barrier elements juxtaposed in substantially parallel planes, corresponding straps of adjacent barrier elements juxtaposed with respect to each other, the adjacent straps of each barrier element being horizontally offset relative to each other to thereby define a plurality of openings, each opening having a horizontal dimension sufficient to permit passage of a portion of the fuselage of an aircraft to be arrested while preventing passage of the wings of said aircraft;

means slidably attached to corresponding vertically disposed rope members of each said barrier element for connecting each said vertically disposed rope member to a corresponding energy absorber, wherein said rope members each comprise a polyurethane coated nylon rope having a predetermined diameter and said vertically disposed engaging straps each comprise multi-ply nylon webbing and each said edge protector comprises nylon webbing having a polyurethane coating thereon; and

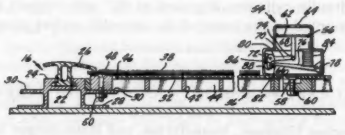
means attached to the vertically disposed rope members of each barrier element for connecting each said vertically disposed rope member to a corresponding stanchion.

3,938,764

FRANGIBLE AIRCRAFT FLOOR

Robert G. McIntyre, Manhattan Beach, and Otto J. Minnich, Orange, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 19, 1975, Ser. No. 578,479
Int. Cl.² B64C *1/18*
U.S. Cl. 244—117 R **9 Claims**



1. A frangible aircraft floor comprising a porous floor support;

a frangible panel on said support; and

means responsive to a predetermined environmental condition for striking said panel to disintegrate it.

3,938,765

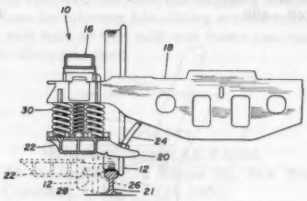
DERAILMENT DETECTOR

Geoffrey Wilton Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 162,609, July 14, 1971, abandoned. This application Aug. 3, 1973, Ser. No. 385,384
Int. Cl.² B60T *7/12*; B61H *11/02*
U.S. Cl. 246—172 **5 Claims**

1. A safety device for initiating an air brake application on a railway car having conventional side frames with tension members which support suspension springs and rotatably mounted wheels and an air brake system, comprising a hollow metal shoe having a fracture groove on the lower side thereof,

one end of the same shoe being attached to and extending laterally from an inside surface of the tension members of the side frames in close proximity and overlying the adjacent running rail, and means connecting the cavity in said shoe to



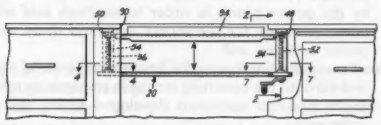
the air brake train line, said shoe being arranged to strike the adjacent rail and fracture upon derailment of any wheel thereby opening said cavity and venting air from the brake train line to the atmosphere.

3,938,766

ADJUSTABLE TYPEWRITER PLATFORM MECHANISM

Bruce E. Herbolsheimer, and Douglas D. Marsh, both of Auburn, Ind., assignors to Garrett Tubular Products, Inc., Garrett, Ind.

Filed Dec. 6, 1974, Ser. No. 530,210
Int. Cl.² F16F *15/01*; F16M *7/00*
U.S. Cl. 248—23 **18 Claims**



1. An adjustable typewriter platform mechanism for use with a desk having a desk top with a typewriter platform recess, the mechanism comprising a horizontally disposed U-shaped base plate having two substantially parallel and elongated sides and having a cross-member interconnecting said sides;

means for fastening said base plate to said desk with said base plate being horizontally disposed below said desk top;

a plurality of vertically disposed jack-screws each having one end thereof rotatably journalled in said base plate for nontranslational rotation therein, being spaced both longitudinally along and transversely from a horizontal axis on said base plate, and each having the other end thereof rotatably journalled in said fastening means for notranslational rotation therein;

means, including a pair of parallel spaced and horizontally disposed support-bars, for supportably attaching a typewriter platform to said jack-screws to receive lifting motion therefrom, to permit limited vertical motion between said support-bars and said jack-screws, and to permit limited relative horizontal movement between said support-bars and said jack-screws in two horizontal and orthogonally intersecting axes; and

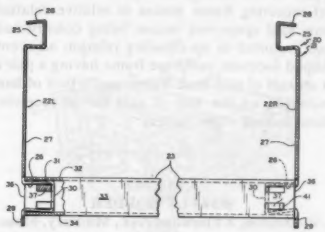
means for simultaneously rotating all of said jack-screws.

3,938,767

CABLE TRAY

George W. Norris, Syracuse, N.Y., assignor to Crouse-Hinds Company, Syracuse, N.Y.

Filed Oct. 30, 1974, Ser. No. 519,086
Int. Cl.² E21F *17/02*; F16L *3/00*
U.S. Cl. 248—58 **4 Claims**



1. A cable tray section, comprising: a sheet metal side rail at each side, a plurality of hollow, bent sheet metal rungs substantially rectangular in cross section, each rung bottom comprising horizontal flanges spaced on either side of an opening to the rung interior, each side rail having an upstanding web, the web having an inwardly-offset hollow flange formed adjacent to and along its bottom edge, the hollow flange having three sides bent about a keystone-shaped, outwardly opening groove, the groove being narrower across its open side than across its inward and closed side, the hollow flange having spaced pairs of vertically-extending slots thereacross at selected spaced intervals along each rail, each rung-end having its sides engaged in the hollow flange paired slots and the rung-ends abutting the upstanding webs above and below the hollow flange, at least one rung joiner for each rung-end, each joiner being longer than the width of the rung and substantially rectangular in cross section, each rung-end having at least one pair of horizontally aligned rectangular joiner slots through its sides receiving a joiner, each joiner having a tapered end adapted to be inserted in a rung-end slot, the rung-end slots being spaced from the rung-ends a selected distance and drivingly receiving a joiner therethrough and clampingly securing the rung-end against the abutting adjacent flange web, a plurality of hangers, each hanger having a railengaging portion at one end and a flat, normally horizontallydisposed, projecting portion at the other end, the projecting portion having a hole therethrough the rail-engaging portion having a length and normally horizontal width adapting this portion to be inserted in the outwardly-opening groove when the projecting portion is vertically disposed, the normally upper and lower surfaces of the railengaging portion being arcuately curved from side to side and being outwardly tapered lengthwise of the hanger to conform to the keystone shape of the rail groove, the rail engaging portion being inserted in the rail groove and rotated 90° until the projecting portion is turned to its normal horizontal disposition, the rungs being first secured to the side rails and the hangers thereafter secured in place between selected rungs, and table tray support rods each having one end secured to supporting structure and having its other end passing through a respective hanger projecting portion hole and secured thereto.

3,938,768

BARREL HANDLER

Don L. Babcock, Box 62, Utica, Kans. 67584

Filed June 24, 1974, Ser. No. 482,794
Int. Cl.² B62B *3/08*
U.S. Cl. 248—129 **8 Claims**

1. A barrel handler forming a two-piece rack for loading, unloading and transporting barrels and the like comprising a pair of box tubing forming a base frame having a central frame

forming with said box tubing a U-shaped recesses at each of the ends thereof, a pair of upstanding pair of box tubing having its lower end disposed centrally of and secured to said base frame, a pair of support box tubing forming a support frame and connected between extremities of said base frame and said support frame, a movable barrel receiving frame means pivotally disposed and mounted on the free end of said upstanding pair of box tubing, and space-rest means to support the barrel receiving frame means in relative relation to the base frame, said space-rest means being constructed of box tubing and mounted in up-standing relation adjacent one of said U-shaped recesses, said base frame having a pair of wheel rollers at an end of said base frame, and a pair of handle grip means mounted on the end of said barrel receiving frame means distal to said wheel rollers.

3,938,769

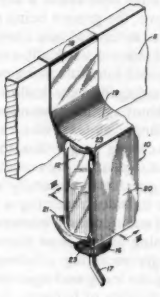
BOTTLE HOLDER

Hyatt G. Wetherbee, 8 Elmwood Ave., Millbury, Mass. 01527

Continuation of Ser. No. 366,530, June 4, 1973, abandoned, which is a continuation of Ser. No. 244,411, April 17, 1972, abandoned. This application Nov. 18, 1974, Ser. No. 524,444

Int. Cl.² A61M *27/00*; A47G *29/00*

U.S. Cl. 248—312 **5 Claims**



1. A bottle holder for holding an animal-feeding bottle adjacent the plane of a horizontal support, comprising

a. a first, substantially hook-shaped portion adapted to fix the holder to the support,

b. a second portion extending generally horizontally from the first portion,

c. a third portion extending downwardly from the second portion, so that said third portion is spaced from the plane of the support, and

d. a fourth portion attached to said third portion, directed horizontally back toward the plane of the support, and adapted to carry an inverted bottle so that a substantial part of the bottle is held in a volume of space defined by the second, third, and fourth portions of the holder, and by the plane of the wall, the frame being stamped from a single sheet of metal, the bottle being provided with a neck of reduced diameter and a cap, an aperture being provided in the fourth portion through which the neck extends, the diameter of the aperture being such that the reduced neck without the cap can pass through said aperture, but cannot pass through with the cap in place, the frame being constructed of opaque sheet material and thus obscuring from view a large portion of the bottle.

3,938,770

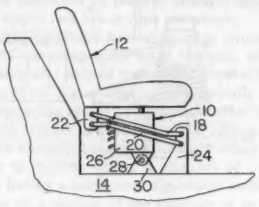
METHOD AND APPARATUS FOR HYDRAULICALLY SUSPENDING A VEHICLE SEAT

Leland D. Turner, East Peoria, and Donald L. Smith, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 7, 1974, Ser. No. 512,195

Int. Cl.² F15B *1/02*; F16M *13/00*; F15C *4/00*

U.S. Cl. 248—400 **16 Claims**



1. A hydraulic suspension assembly for regulating movement of a vehicular seat in response to vertical travel of the vehicle, comprising

a power piston reciprocably arranged within a power cylinder, the piston and cylinder comprising a flexible coupling between the vehicular seat and a suitable support structure, the power piston tending to be movable within the power cylinder and to develop pressure variations within the power cylinder in response to relative movement between the vehicular seat and the support structure,

a source of fluid under pressure,

a control valve for selectively communicating the source and a fluid drain with the power cylinder on opposite sides of the power piston,

means for operating the control valve in response to the pressure variations developed within the power cylinder by the power piston in order to establish said selected communication for the source and fluid drain with the power cylinder, and

load compensating means for limiting response of the control valve to the operating means in response to relatively minor pressure variations developed within the power cylinder,

the load compensating means comprising a restrictive orifice for communicating one end of the control valve spool with an end of the power cylinder subject to increased pressurization in response to downward movement of the vehicular seat relative to the vehicle.

3,938,771

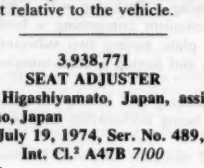
SEAT ADJUSTER

Muneharu Urai, Higashiyamato, Japan, assignor to Takeji Saito, Musashino, Japan

Filed July 19, 1974, Ser. No. 489,501

Int. Cl.² A47B *7/00*

U.S. Cl. 248—429 **8 Claims**



1. A seat adjuster for use in a vehicle or the like comprising a pair of bars supported in parallel with each other on the floor

surface of the vehicle, a seat frame supporting a seat body thereon and including a pair of opposite vertical side walls each having a substantially horizontal flange formed integrally therewith extending inwardly therefrom, said flanges extending the depth of the seat, and bar engaging means formed on each of said flanges, said bar engaging means having a sectional shape complementary to the sectional shape of at least a portion of each said bar, said bar engaging means engaging with said bars for allowing free sliding movement of said seat frame on said bars so that said seat frame can make sliding movement along said bars.

3,938,772

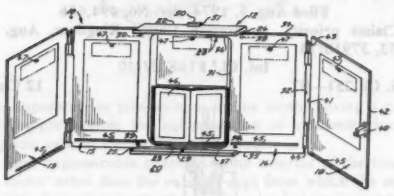
FOLDING DISPLAY EASEL

Peter W. M. Andrusiak, 124 Regina St., New Westminster, British Columbia, Canada (V3L 1S5)

Filed Nov. 25, 1974, Ser. No. 526,905

Int. Cl.² A47B 97/08

U.S. Cl. 248—461 **10 Claims**



1. A folding display easel for supporting documents for easy viewing, the easel having:

a. a center panel having a front face and spaced, parallel upper and lower edges and spaced side edges, the upper and lower edges having parallel track means spaced forwardly of said front face,

b. a leg hinged to the center panel and adapted to extend therefrom, the leg being restricted against swinging relative to the center panel to support the center panel generally upright when the easel is erected and stood on a generally horizontal working surface,

c. right-hand and left-hand inner panels engaging the respective parallel track means of the center panel for sliding of the inner panels relative to the center panel, the inner panels being spaced laterally from each other and forwardly from the center panel to permit sliding together of the panels for stacking, each inner panel having respective inner and outer edges and respective parallel upper and lower edges,

d. right-hand and left-hand outer panels having respective inner and outer edges, the inner edges of the left-hand and right-hand outer panels being hinged to the outer edges of the left-hand and right-hand inner panels respectively, each outer panel being adapted to be folded essentially flat against the respective inner panel and when so folded to be spaced laterally from the adjacent inner panel and the center panel, so that when each outer panel is folded against its respective inner panel, the inner panels can be slid together along the track means without interference between adjacent panels so that the five panels are stacked together.

3,938,773

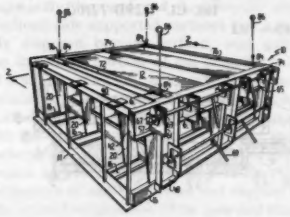
APPARATUS INCLUDING CAMMED FASTENING MEANS FOR MAKING MODULAR CRYPTS

Edward C. Duwe, and William E. Duwe, both of Oshkosh, Wis., assignors to Duwe Precast Concrete Products, Inc., Oshkosh, Wis.

Filed Oct. 15, 1974, Ser. No. 514,932

Int. Cl.² B28B 7/22

U.S. Cl. 249—27 **9 Claims**



1. Apparatus for casting reinforced concrete crypt modules comprising;

a base;

a shaped casting form supported on said base for receiving fluent casting material therein, one end of said casting form being open;

an end door pivotally mounted to said base in confronting relation with the open end of said casting form, said end door having spaced slots extending therethrough; and

means mounted to said end door and said casting form for urging said end door sealingly against the open end of said casting form;

said means including spaced arm members positioned at the open end of said casting form and arranged to penetrate a respective slot in said end door, each arm member having a cam slot disposed in the penetrating end thereof, spaced cam plates affixed to said end door, each of said cam plates positioned adjacent a respective slot in said end door and having an opening therethrough, cam bar means having axially spaced cams thereon and extending through the openings of at least two cam plates, said cams being disposed in said cam slots of each of said arm members.

3,938,774

METHOD AND APPARATUS FOR SEALING LEAKING PIPELINE JOINTS

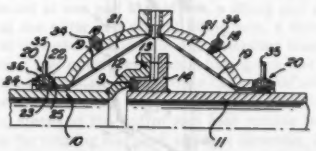
Edward Peter Smith, Burton-Upon-Trent, England, assignor to BTR Industries Limited, England

Filed May 23, 1974, Ser. No. 472,820

Claims priority, application United Kingdom, July 2, 1973, 31492/73

Int. Cl.² B22D 19/04; B25P 13/02

U.S. Cl. 249—90 **8 Claims**



1. Apparatus for sealing a leaking joint in a pipeline, which apparatus comprises a separable mould which can be located around, and sealed to, a pipeline, which mould comprises a flexible inner lining which in use defines in conjunction with the pipeline a mould chamber enclosing the joint, an outer rigid casing which in use surrounds and is sealingly connected

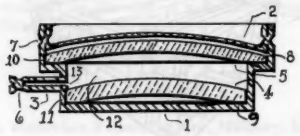
to the lining to provide a space therebetween, means to allow sealant under pressure to be injected into the mould chamber and means for connecting the space between the lining and the casing to a source of fluid pressure.

3,938,775

MOLD ASSEMBLY FOR CASTING SYNTHETIC LENSES

George M. J. Sarofeen, 107 Hanover Ave., Colonial Heights, Va. 23834

Filed Aug. 20, 1973, Ser. No. 390,060
Int. Cl.² B29D 11/00
U.S. Cl. 249—102 12 Claims



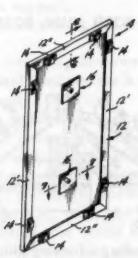
1. A mold assembly for casting synthetic resin lenses comprising a resilient mold assembly support member in the form of an irregular cylinder having at least a pair of mold element positioning shelves of different diameters for supporting said mold elements and adjacent resilient walls connected to said positioning shelves, at least one of said walls interconnecting a pair of shelves, a plurality of mold elements of different diameters, each mold element being positioned on one of said shelves, said mold elements being disposed in an axially spaced relationship and with the periphery of said mold elements being in sealing contact with the inner surface of the walls, of said cylinder, each of said walls having an inner diameter slightly less than the diameter of the associated mold element before insertion of the mold elements and a sealed cavity having a boundary formed by opposing surfaces of the mold elements and the wall of the mold assembly supporting member between said mold elements within which a synthetic resin may be cast by polymerization, the boundary of said cavity including the entire surface of one face of one of the mold elements said face extending to the outermost periphery of the mold element.

3,938,776

FORMING PANEL WITH CONNECTION MEANS FOR ABUTTING PANELS

Stanley J. Frazier, 3206 S. Hudson St., Seattle, Wash. 98118

Division of Ser. No. 77,935, Oct. 5, 1970, Pat. No. 3,687,411.
This application Feb. 7, 1972, Ser. No. 224,218
Int. Cl.² E04G 9/05
U.S. Cl. 249—114 5 Claims



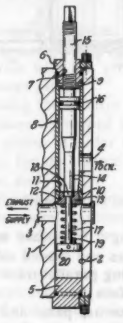
1. A forming member comprising a quadrilateral panel, the edges of which are straight from corner to corner thereof, said panel having a flat operatively interiorly oriented face and a raised marginal frame around the perimeter of the operatively exteriorly oriented face thereof, which frame has a flat face adapted to serve as a bearing surface for a waler, and pairs of connector means laterally outstanding therefrom, at spaced points thereon, which define pairs of spaced, coplanar, open-ended, edge oriented slots on all four sides of the panel, the open ends of which slots are spaced inwardly from the adjacent edges of the panel to enable one leg of an L-shaped key to be inserted in each slot while the other leg of the key is interposed in laterally outstanding condition from the frame, between the slot and the adjacent edge of the panel, said pairs of connector means being aligned with one another on spaced lines extending parallel to the axes of the panel, between the opposing sides thereof, and there being an apertured intermediate bearing surface for the waler raised on the operatively exteriorly oriented face of the panel, which is coplanar with the face of the frame, but disposed within the frame at a point positioned intermediate opposing sides of the panel in the space between the pairs of connector means thereadjacent, so that the waler can make three pointed contact with the intermediate surface and the frame within the space between the latter pairs of connector means.

3,938,777

CONTROL VALVES

Thomas Vincent Foster, and Frank Alan Fenton, both of Doncaster, England, assignors to Emhart Corporation, Farmington, Conn.

Filed Aug. 5, 1974, Ser. No. 494,656
Claims priority, application United Kingdom, Aug. 10, 1973, 37910/73
Int. Cl.² F16K 31/50
U.S. Cl. 251—82 12 Claims



1. A flow control valve for controlling the rate of flow of gas in one direction through the valve comprising a housing having therein a bore with first and second ends, first and second ports communicating with the bore in the housing, the first port being a lesser distance from the first end of the bore than is the second port, a sleeve mounted within the bore and having a double conical seat located between the first and second ports and providing similar first and second valve seats of which the first valve seat is at a lesser distance from the first end of the bore than is the second valve seat, a support stem extending longitudinally within the bore, a valve member slidable along the support stem within the bore, a stop in a fixed position on the support stem within the bore, spring means carried by the support stem and biasing the valve member towards the said stop and towards one of the valve seats, and adjustable mounting means mounting the support stem in the first end of the bore and enabling longitudinal movement of the support stem relative to the bore to be effected whereby the stop may be positioned relative to one of the valve seats such that the valve member is biased into engagement with the stop by the spring means and a predetermined aperture is formed between the valve member and the said one of the

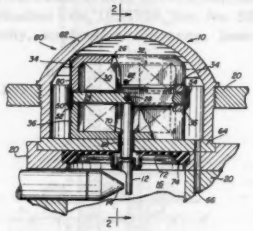
valve seats for controlling the rate of flow of gas past the said one valve seat in a first direction but the valve member is able to move against the action of the spring means to permit a substantially unrestricted flow of gas past the valve seat in a direction opposite to the said first direction.

3,938,778

METHOD AND APPARATUS FOR PROTECTING AN IMMERSED TORQUE MOTOR AGAINST CONTAMINATION

Kenneth P. Hansen, Enfield, and Robert K. Olson, Bloomfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,644
Int. Cl.² H01F 7/08; F16K 31/04
U.S. Cl. 251—129 **16 Claims**



9. Apparatus for protecting a torque motor having a movable flapper against the accumulation of contamination in magnetic gaps of the motor comprising:

a fluid impermeable coating on the exterior of the torque motor other than the exterior area from which the movable flapper projects, the coating also having an aperture located at a low flux area on the exterior of the torque motor through which fluid may reach the interior of the motor; and

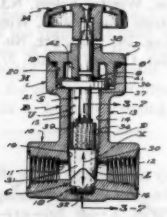
fluid sealing means extending between the coating on the motor exterior and the movable flapper to permit the flapper to move in response to motor torquing.

3,938,779

PLASTIC VALVE

Braham G. Benjamin, Tustin, Calif., assignor to Flo-Tite Plastics Corporation, Temple, Tex.

Filed Aug. 1, 1974, Ser. No. 493,530
Int. Cl.² F16K 3/12
U.S. Cl. 251—268 **4 Claims**



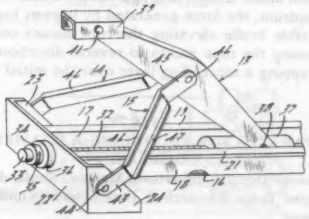
1. A gate valve comprising a body with an elongate horizontal axially extending lower portion and an elongate central portion between the ends of and extending upwardly from the lower portion and defining a normally closed chamber with an upper portion and a lower portion with flat axially spaced, substantially axially inwardly disposed, axially inwardly and downwardly inclined end seat surfaces, laterally spaced substantially laterally inwardly disposed, laterally inwardly and downwardly inclined side support surfaces and a substantially upwardly disposed bottom surface, an axially extending flow passage in the lower portion of the body intersecting the lower portion of the chamber and communicating therewith substantially centrally of said seat surfaces, a vertically extending vertically shiftable gate of flexible resilient material in the chamber and having a top, axially spaced substantially axially outwardly disposed and axially inwardly and downwardly inclined end sealing surfaces, laterally spaced substantially laterally outwardly disposed and downwardly and laterally inwardly inclined side supported surfaces and a substantially downwardly disposed bottom surface, said gate normally arranged in the lower portion of the chamber with its supported and sealing surfaces in tight wedging engagement with opposing related seat and support surfaces of the chamber and with the bottom surface of the gate in spaced opposing relationship with the bottom surface of the chamber and operating means to selectively shift the gate vertically to and from said normal position and in the upper portion of the chamber, the angle of inclination of said supported and support surfaces is less from the central vertical axis of the gate and chamber than is the angle of the sealing and seat surfaces from said vertical axis.

3,938,780

AUTOMOBILE CHASSIS JACK

Murray L. Hauptman, 23200 Orleans Place, Southfield, Mich. 48075

Filed Feb. 21, 1974, Ser. No. 444,325
Int. Cl.² B66F 3/00
U.S. Cl. 254—126 **11 Claims**

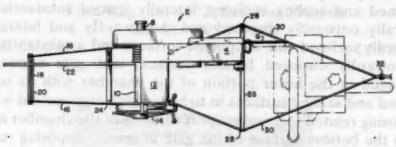


1. In an automobile chassis jack, an elongated base, a shaft extending along said base, a nut mounted on said shaft, means interconnecting said nut and shaft whereby rotation of said shaft will cause axial movement of the nut, a lifting arm pivotally connected at one end to said nut, a lifting pad pivotally mounted at the outer end of said lifting arm, a thrust plate mounted at one end of said base and extending transversely thereacross, a pair of side levers each having one end pivoted adjacent said thrust plate, the opposite ends of said side levers being pivotally connected to an intermediate portion of said lifting arm, means at the end of said base remote from said thrust plate for rotating said shaft in either direction, whereby said lifting pad may be moved between a raised position and a lowered position, the lifting pad in its lowered position being remote from said rotating means whereby the lifting pad may be placed beneath a chassis without the necessity of inserting intermediate portions of the jack beneath the chassis, and means for preventing a load on said lifting pad transmitted to said nut from rotating said shaft.

3,938,781
LEVEL WIND FOR WINCH

Truxtun Craven; Carlyle A. Crecelius, and Clayton W. Philbrick, all of Vashon, Wash., assignors to Olympic Instruments Inc., Vashon, Wash.

Filed Oct. 12, 1972, Ser. No. 296,787
Int. Cl. B66d 1/76
U.S. Cl. 254—175.7 8 Claims



1. A level wind winch for use in combination with a power source, comprising:

a winch unit including a frame and a winch drum mounted for rotation about its central axis to the frame,

flexible rope means secured about the drum,

a flexible bridle comprising a pair of equal length cables securing opposite sides of the winch frame to a common fixed point of attachment rearwardly of the winch frame,

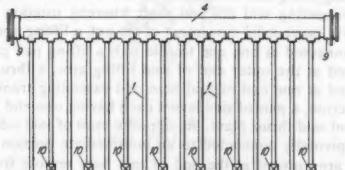
a spreader bar of greater length than the winch drum extending intermediate the point of attachment and the winch frame substantially parallel to the central axis of rotation of the winch drum,

cable retainers on the outer ends of the spreader bar through which the cables of the flexible bridle pass, the bridle allowing the winch unit to pivot about an imaginary vertical line perpendicular to the central axis of the winch drum and intermediate the winch drum and spreader bar when the rope means is being wrapped about the winch drum under tension and approaches either of the ends of the drum, the force generated by uneven loading on the flexible bridle elevating the rope means one wrap and causing the rope means to reverse directions and begin wrapping a succeeding layer over the initial layer.

3,938,782
APPARATUS FOR PRODUCING A FOAMED FIBRE DISPERSION

Neil George Douglas Robertson, Marlow, England, assignor to Wiggins Teape Research & Development Limited, London, England

Continuation-in-part of Ser. No. 347,561, April 3, 1973. This application Oct. 25, 1974, Ser. No. 518,187
Claims priority, application United Kingdom, Apr. 7, 1972, 16210/72
Int. Cl.² B01F 15/02
U.S. Cl. 259—4 R 23 Claims

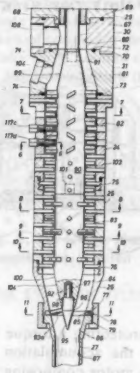


12. Apparatus according to claim 11, including a vacuum system operable to remove liquid from foamed fibre dispersion on the foraminous support and a pump and return pipe arranged to return to the mixer liquid removed from the foamed fibre dispersion on the foraminous support.

3,938,783
METHOD FOR CONTINUOUS MIXING OF FOAM MATERIALS

Lawrence C. Porter, Palos Verdes Peninsula, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 85,639, Oct. 30, 1970, abandoned. This application Mar. 27, 1973, Ser. No. 345,297
Int. Cl.² B01F 7/18
U.S. Cl. 259—7 3 Claims



1. A method of commingling liquid materials having different viscosities to provide a substantially homogeneous mixture, comprising

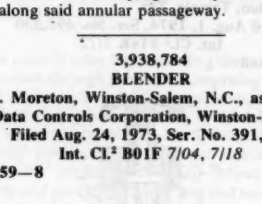
introducing said materials into a stream flowing along an annular passageway, different ones of siad materials being introduced into said passageway at different locations therealong,

transversely shearing said stream at a plurality of locations along its path with pin-like members having cross-sectional configurations which are different at different locations such that the mixing and shearing action exerted on said stream progressively increases during its flow along said annular passageway.

3,938,784
BLENDER

George C. Moreton, Winston-Salem, N.C., assignor to Electronic Data Controls Corporation, Winston-Salem, N.C.

Filed Aug. 24, 1973, Ser. No. 391,466
Int. Cl.² B01F 7/04, 7/18
U.S. Cl. 259—8 22 Claims



19. A blender for mixing liquids, liquids and powders, or similar products, said blender comprising a substantially

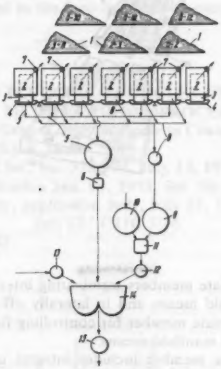
closed blending bowl generally vertically disposed and having a bottom wall, an intake port adjacent one end of said bowl and a discharge port adjacent the other end thereof, said discharge port being disposed adjacent the outer edge of said bottom wall and said bottom wall sloping downwardly toward said outer edge thereof, an impeller mounted in said bowl for rotation about a generally vertical longitudinal axis and having radially extending blades disposed intermediate said intake and discharge ports and extending over said bottom wall, and means for rotating said impeller.

3,938,785

METHOD AND APPARATUS FOR MANUFACTURING A COATING MASS FOR ROAD CONSTRUCTIONS

Carl-Hermann Heise, Hannoversche Str. 61, 3220 Alfeld, Germany

Division of Ser. No. 368,352, June 8, 1973, Pat. No. 3,880,410.
This application Feb. 18, 1975, Ser. No. 550,865
Claims priority, application Germany, June 10, 1972, 2228407
Int. Cl.² B28C *1/22*
U.S. Cl. 259—149 **5 Claims**



1. A method for manufacturing a coating mass for road constructions, wherein stone minerals of different grain size ranges are dosed, dried, heated, dusted off, and mixed with a binding agent and other flux materials, the stone minerals of the various grain size ranges being separately pre-dosed, dried, and heated, wherein individually absorbed fine material is divided into a sand fraction and into a self filler fraction by means of filtering, wherein the sand fraction is again added to the stone fraction of the respective grain size range, wherein the self filler fractions of all grain size ranges are combined, and wherein the heated stone fractions are weighted and mixed together with the combined self filler fractions and the binding agent in order to form the coating mass.

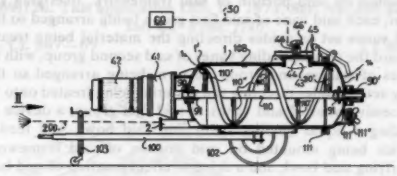
3,938,786

APPARATUS FOR WET SPRAYING OF CONCRETE

Jean Bernold, Im Hasenberg, 8880 Walenstadt, Switzerland

Division of Ser. No. 311,500, Dec. 4, 1972, abandoned. This application May 2, 1974, Ser. No. 466,474
Int. Cl.² B28C *5/06*
U.S. Cl. 259—151 **14 Claims**

1. An apparatus for the wet spraying of concrete, comprising a mixer embodying a mixing container incorporating means for closing such in a gastight fashion, a compressed air source connected with the mixing container, said mixing container incorporating a closable concrete outlet opening defined by a connection pipe, a substantially cylindrical concrete containing conduit of substantially constant diameter detachably introduced at one inner end through the connection pipe and in a position substantially flush with the inner wall of the mixing container, and a number of supplementary air infeed conduits located near the mixer and opening into the concrete



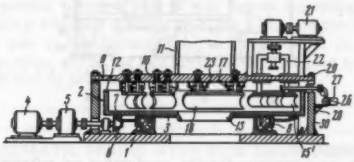
containing conduit at locations spaced circumferentially about the periphery thereof for the infeed therein of compressed air to suppress the formation of concrete slugs, the infed compressed air flowing towards the central lengthwise extending axis of the concrete containing conduit to break-up any possibly formed concrete slugs.

3,938,787

APPARATUS FOR MIXING AND GRANULATING BULK MATERIALS

Vitaly Petrovich Bobylev, ulitsa Naberezhnaya imeni Lenina, 120, kv. 7; Alexandr Feodosievich Kravtsov, ulitsa Pisarzhevskogo, 6a, kv. 6, both of Dnepropetrovsk; Vitaly Nikolaevich Bytkin, prospekt Lenina, 234, kv. 32, and Ruvim Semenovich Bershtein, prospekt Metallurgov, 22, kv. 58, both of Zaporozhie, all of U.S.S.R.

Filed Dec. 31, 1974, Ser. No. 537,772
Claims priority, application U.S.S.R., Jan. 3, 1974, 1981783
Int. Cl.² B28C *5/18*
U.S. Cl. 259—177 R **4 Claims**



1. An apparatus for mixing and granulating bulk materials, comprising: a framework; a bowl mounted on said framework for rotation about a vertical axis; a peripheral wall for said bowl, adjacent to which a material to be treated can be charged into said bowl; a bottom for said bowl having a discharge opening at the center thereof; a portion of said framework, said portion overlying said bowl; a first group of vanes, in which each vane has one end thereof adjoining the discharge opening of said bowl, the vane curving arcuately in longitudinal and transverse directions and having a side thereof, which is convex in the longitudinal direction and concave in the transverse direction, facing in a direction which is opposite to that of rotation of said bowl, the vane being mounted on said portion of said framework, overlying said bowl; a second group of vanes, in which each vane has one end thereof adjoining the peripheral wall of said bowl, the vane being defined by at least two steps curving arcuately in the transverse direction and arranged in a horizontal direction, the vane having a side thereof, which is concave in the transverse direction, facing in a direction which is opposite to that of rotation of said bowl, the vane being inclined in the direction of rotation of said bowl so that it provides an acute angle with a radius extending from the center of said bowl to

the end of this stepping vane, adjoining the peripheral wall of said bowl, the vane being mounted on said portion of said framework, overlying said bowl; a discharge blade spanning jointly with such one of said stepping vanes, which is the most remote in succession in the direction of rotation of said bowl; the space between the peripheral wall of said bowl and the discharge opening in said bowl, said discharge blade being mounted on said portion of said framework, overlying said bowl; each said vane of said first group being arranged so that said vanes set as guides directing the material being treated toward the corresponding vanes of said second group, with the vanes of said second group, in turn, being arranged so that they act as guides directing the material being treated onto the successive ones of said vanes of said first group; a device for feeding a liquid binding agent into said bowl, said feeding device being mounted on said portion of said framework, overlying said bowl; and a drive to effect rotation of said bowl about the vertical axis thereof.

3,938,788

APPARATUS FOR THE PRODUCTION OF METALS BY A SMELTING METALLURGICAL PROCESS

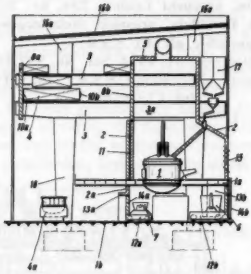
Franz Josten, Duisberg, Germany, assignor to Fried. Krupp Huttenwerke AG, Bochum, Germany

Filed Dec. 9, 1974, Ser. No. 531,023

Claims priority, application Germany, Feb. 2, 1974, 2405038

Int. Cl.[2] C21C 5/40

U.S. Cl. 266—13 **12 Claims**



1. In an apparatus for the production or refinement of metals comprising a furnace and a hood disposed thereover, the improvement which comprises an upper chamber surrounding the sides and the top of said furnace, said upper chamber having at least one chamber side wall, said wall having a first movable door therein, a runway disposed partially within said chamber and partially out of said chamber, a charging crane disposed on said runway having disposed at one end thereof a second movable door movable therewith, means connected to said charging crane for moving said first movable door to permit entry of said charging crane, the size of said first and second movable doors being such as to substantially occupy the entire entrance way to said upper chamber.

3,938,789

METALLURGICAL COOLING PANEL

Raymond E. Richards, 36227 Ridge Road, Willoughby, Ohio 44094

Filed Dec. 5, 1973, Ser. No. 422,026

Int. Cl. C21c 5/40

U.S. Cl. 266—16 **13 Claims**

1. A panel for use in internal cooling comprising,

a pair of oppositely disposed metal plate members,

said plate members being spaced apart and joined at their edges to provide a fluid transmitting passageway therebetween,

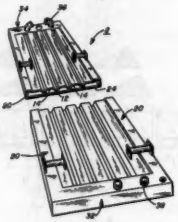
at least one of said plate members including integral laterally spaced continuous corrugations defining generally parallel channels in said passageway for directing fluid flow longitudinally in said panel,

manifold means disposed adjacent each of the opposed ends of said plate members and communicating with said channels,

said manifold means is of a box-like construction extending transversely across the width of said plate members,

said box-like construction defined by an end wall, an inner wall and a top wall,

said inner wall secured in fluid sealed relation to the confronting surface of said one plate member and axially inwardly of the terminal end edge thereof,



one of said plate members terminating interiorly of one of said manifold means and in laterally off-set relation to said other plate member for controlling fluid flow interiorly of said manifold means,

said one plate member includes integral upstanding side walls extending longitudinally thereof and secured in fluid sealed relation to the corresponding opposed sides of said other plate member,

said side walls extending parallel to each other and interiorly of said manifold means,

said inner wall being secured in fluid sealed relation at its opposed ends to said side walls axially inwardly of the respective ends thereof,

a series of plug welds securing said one plate member to said other plate member, and

said plug welds being disposed in the area of said corrugations between said channels.

3,938,790

METHOD AND CONVERTER FOR REFINING PIG-IRON INTO STEEL

Helmut Knuppel; Karl Brotzmann; Hans-Georg Fassbinder, all of Sulzbach-Rosenberg, Germany; Guy Savard, Vaudreuil, and Robert Lee, Montreal, both of Canada, assignors to Eisenwerk-Gesellschaft Maximilianshutte mbH, Sulzbach-Rosenberg, Germany

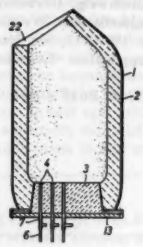
Division of Ser. No. 800,892, Feb. 20, 1969, Pat. No. 3,706,549. This application June 15, 1971, Ser. No. 153,277

Int. Cl.[2] C21C 5/42

U.S. Cl. 266—35 **6 Claims**

1. A converter consisting essentially of a sheet-steel casing with a refractory lining and an inserted nozzle bottom in which

a substantial portion of the converter bottom is free of nozzles, and in which the nozzles are each made up of an oxygen pipe



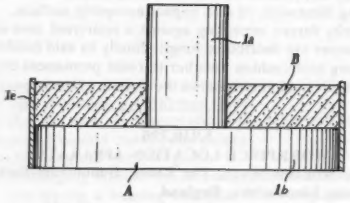
and a concentric encasing gas pipe, and in which a non-return valve is arranged in the feed line to each encasing-gas pipe.

3,938,791

DEVICE FOR PLUGGING TAP-HOLES OF REACTORS FOR METALLURGICAL PROCESSES

Bruno Imberti, Genova, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Continuation of Ser. No. 378,994, July 13, 1973, abandoned. This application Jan. 14, 1975, Ser. No. 540,868
Claims priority, application Italy, July 31, 1972, 51891/72
Int. Cl.[2] C21C 5/46
U.S. Cl. 266—42 1 Claim



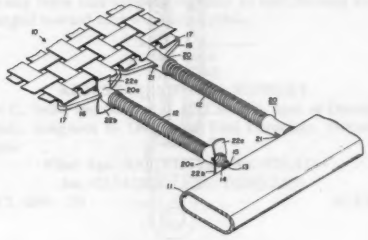
1. A device for plugging the taphole from within reactors for metallurgical processes, comprising a solid element made of refractory material and having an enlarged substantially cylindrical head, an annular packing consisting essentially of a mixture of refractory material in powder form and of a binder, said packing being disposed on the same side of said head as said element and surrounding one end of said element, said material being cold coherent and plastically deformable for increasing values of the temperature within the limits of the thermal interval within which the mixture sets, and becoming indeformable for values of the temperature higher than the said thermal setting interval, but lower than the operating temperature of the reactor, after a period of exposure to the operative conditions longer than the time necessary for installing the plug, and an annular collar member made of sheet material and surrounding said annular packing and spaced outwardly from said solid element by said annular packing.

3,938,792

PROTECTIVE END COVERS FOR THE RESILIENT SUSPENSION MEMBERS OF TRAMPOLINE BEDS AND THE LIKE

George P. Nissen, Cedar Rapids, Iowa, assignor to Nissen Corporation, Cedar Rapids, Iowa

Division of Ser. No. 462,662, April 22, 1974, Pat. No. 3,869,120. This application Oct. 18, 1974, Ser. No. 515,823
Int. Cl.[2] F16F 1/46
U.S. Cl. 267—69 1 Claim



1. For use with apparatus for rebound of a performer in connection with trampoline, gymnastic and like activities, the apparatus having a frame and a flexible bed resiliently suspended from the frame by a plurality of resiliently extensible members between opposed marginal edges of the frame and the bed, each extensible member having an end portion and an outer hook removably connected to one of said marginal edges, the hook extending transversely across the adjacent end portion of the extensible member and terminating in an exposed hook end subject to contact by a performer, a protective device comprising: a flexible sleeve having two longitudinally adjacent portions, the first portion being adapted to encompass said member end portion to locate the sleeve relative to the extensible member, the wall of the second sleeve portion having a pair of slits therein extending in a longitudinal direction inwardly from the outer end thereof to form a pair of flap portions foldable back toward the first sleeve portion, one of the flap portions being adapted to protectively overlie said hook end.

3,938,793

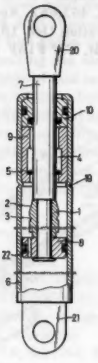
PNEUMATIC SPRING WITH STOP MECHANISM

Panayotis Kaptanis, Neuwied, and Castor Fuhrmann, Brachtendorf, both of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Germany

Filed Aug. 26, 1974, Ser. No. 500,360
Claims priority, application Germany, Sept. 8, 1973, 2345503
Int. Cl.[2] F16F 9/32
U.S. Cl. 267—120 11 Claims

1. A pneumatic spring comprising:
a. a cylinder having an axis and bounding a sealed cavity therein;
b. a piston axially movable in said cavity;
c. a piston rod axially fastened to said piston and extending outward of said cavity in movable, sealing engagement with said cylinder, said piston rod and said cylinder constituting the two principal elements of said spring;
d. a gas under a pressure higher than atmospheric pressure retained in said cavity and biasing said piston rod outward of said cavity;
e. stop means responsive to a first relative axial movement of said elements for impeding relative axial movement of said elements,
1. said stop means responding to a second axial movement of said elements different from said first movement for releasing said elements,

2. said stop means including cooperating stop members axially secured to said elements respectively,
3. said stop members engaging each other while said stop means impede said axial movement; and



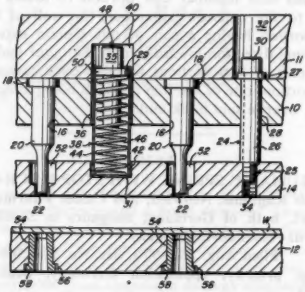
f. means for securing said elements against relative angular movement during said relative axial movements thereof.

3,938,794

CAGED SPRING UNIT

Harry G. Stevens, Union, and Allan E. Randolph, Sr., Dayton, both of Ohio, assignors to Dayton Progress Corporation, Dayton, Ohio

Division of Ser. No. 323,955, Jan. 15, 1973. This application Aug. 21, 1974, Ser. No. 499,269
Int. Cl.² F16F 5/00
U.S. Cl. 267—130 **5 Claims**



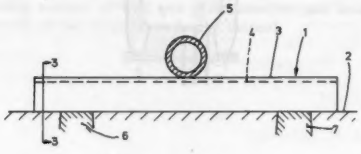
1. A device for use as an independent pre-loaded stripper spring unit comprising a cage containing a longitudinally extending compressible spring, means at one end of said cage providing a seat for one end of said spring, means at the other end of said cage defining an aperture therein, a plunger-like means within and oriented axially of said cage having a portion enlarged in diameter to form opposite facing, axially spaced, shoulders, an inwardly facing shoulder being engaged by an opposite end of said spring and an outwardly facing shoulder limiting against the said other end of said cage around said aperture, under the urging of said spring, an extension of said plunger-like means being projected through said aperture to extend the length of the assembly comprising said cage, said spring and said plunger, said plunger-like means being accessible through its said extension to be moved inwardly of said cage to reduce the normal length of said assembly and apply a spring load to urge an axial projection of said cage, and said plunger extension being fabricated to facilitate a reduction of its projected length and the normal length of said assembly without a requirement for applying an additional load on said spring or said cage.

3,938,795

RESILIENT SHOCK ABSORBING BUMPER

Richard Haar, Braunschweig, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Sept. 19, 1973, Ser. No. 398,818
Claims priority, application Germany, Sept. 21, 1972, 2246220
Int. Cl.² B60R 19/08; B61F 19/04; F16F 3/10, 7/00
U.S. Cl. 267—140 **9 Claims**



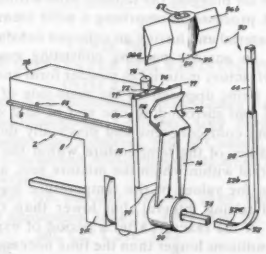
1. A crush resistant bumper for protecting an object against impact collisions, said object having a continuous elongate support surface for said bumper; said bumper comprising:
an elongate resilient cushion member having one side disposed on said support surface of said object, said one side being attached to said support surface in a substantially continuous line along substantially the entire length of said cushion member, said cushion member having an impact accepting surface on the side thereof which is opposite said one side and faces away from said support surface; and
a flexible, pliant band of high tensile strength which is substantially stable in its longitudinal dimension, said band being secured on said cushion member in a region thereof which is closer to said impact accepting surface than to said support surface, said band further being attached to said cushion member at points which define a substantially continuous line substantially coextensive with the long dimension of said impact accepting surface,
whereby forces impacting against a restricted area of said bumper are distributed longitudinally by said band to and along said cushion member to resist permanent crushing of said cushion member in the vicinity of the impact area.

3,938,796

WORKPIECE LOCATION APPARATUS

Gordon Williams Wynn, The Glebe, Holton-cum-Beckering, Lincoln, Lincolnshire, England

Filed July 1, 1974, Ser. No. 484,756
Int. Cl.² B25B 11/00
U.S. Cl. 269—2 **21 Claims**



1. Workpiece location apparatus for making a saw cut at a predetermined location in an elongate workpiece comprising:

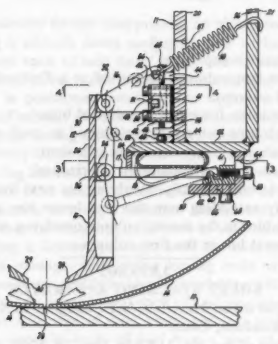
a bearer member adapted to be placed on the workpiece in fixed relation to and engageable with a side face thereof; saw guide means including a planar element carried by said bearer member in fixed relation therewith to thereby define a saw cutting guide plane perpendicular to said side face, said saw guide means including biasing means adapted to urge a saw blade against said planar element and presenting a guide opening for introduction of the saw blade from above, said biasing means and planar element thus being adapted to maintain the saw blade in said saw cutting guide plane during the cutting cycle; and workpiece location means mounted on said bearer member adapted to define a location for the workpiece in a direction transverse to said saw cutting guide plane, said location means being adjustably mounted on said bearer member relative to said guide plane in said transverse direction.

3,938,797

CLAMPING DEVICE FOR WELDING SEAMER

Arthur I. Frederick, Webster Groves, Mo., assignor to The Pandjiris Weldment Co., St. Louis, Mo.

Filed Jan. 9, 1974, Ser. No. 431,905
Int. Cl.² B23K *37/04*; B25B *1/18*
U.S. Cl. 269—20 **10 Claims**



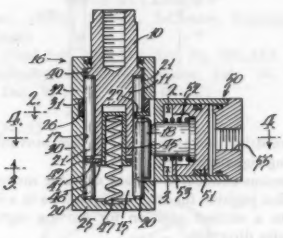
1. In a clamping device for a seamer:
a. a base including a workpiece table,
b. a support member spaced above the table and including first and second connection points,
c. a clamping unit including:
1. a clamping member transversely disposed of said table and having a bearing end adapted to engage a workpiece on the table, a first connection point disposed in lengthwise spaced relation from said bearing end, and a second connection point disposed between said bearing end and said first connection point,
2. a link member pivotally connected between the first connection point of the support member and the first connection point of the clamping member,
3. a pressure lever link member pivotally connected between said second connection point of the support member and the second connection point of the clamping member, and
4. adjustable means for varying the path of the bearing end,
d. an inflatable flexible hose disposed between the support member and the pressure lever link member to apply a force to said pressure lever link member between the connection points to the support member and the clamping member,
e. means for inflating the hose to rotate the pressure lever link member about the second connection point of the support member to urge the bearing end of the clamping member into engagement with the workpiece,
f. means for returning the clamping member out of engagement with the workpiece when the hose is deflated,
g. said clamping member being substantially vertical, and including an inclined outstanding finger at the lower end providing a bearing edge at the bearing end, and
h. the horizontal distance between the link member pivotal connections to the clamping member and support member being less than the horizontal distance between the pressure lever link member pivotal connections to provide relative movement of said bearing edge laterally away from said support member as said bearing edge is urged toward said workpiece table.

3,938,798

ADJUSTABLE WORK SUPPORT

James C. Solie, and Samuel B. McClocklin, both of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Filed Apr. 23, 1975, Ser. No. 570,614
Int. Cl.² G25B *11/00*; B23Q *3/10*
U.S. Cl. 269—20 **10 Claims**



1. An adjustable work support comprising a casing with a cylindrical open-ended chamber, a plunger having a cylindrical stem movable lengthwise in said chamber and an end outside said casing for work-supporting engagement, said chamber having a diameter greater than said stem to provide a space therebetween, a series of round locking pins in said space in side-to-side contact, every other pin movable with the stem and the remaining pins held against movement with the stem, a driving pin positioned between two of said locking pins, and means for exerting a force on said driving pin to force said two locking pins apart and exert a compressive force on said locking pins one against the other to hold the stem in adjusted position.

3,938,799

SIGNATURE ARRANGING DEVICE AND METHOD

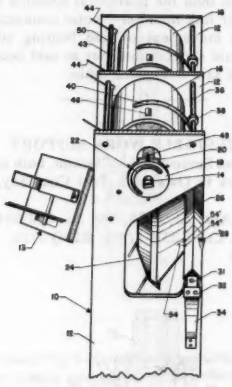
Thomas F. Macke, Fort Lauderdale, Fla., assignor to Hydrabind, Inc., Miami, Fla.

Filed Oct. 24, 1972, Ser. No. 299,819
Int. Cl.² B65H *5/30*
U.S. Cl. 270—55 **11 Claims**

1. A signature inserting and collating device utilized in a bookbinding operation for providing signatures stacked one inside the other in an inserted array or stacked side by side in a collated array comprising:
a magazine for holding a plurality of signatures in said magazine with backbone in a first position or in a second position, oppositely disposed;
a rotatable cylindrical drum having a surface signature connecting means connected tangentially at one point along its surface, said drum connected adjacent to said signature magazine and positioned to receive one edge portion of a signature in said magazine;

said signature connected means separates and holds a signature in said magazine to said cylindrical surface for a predetermined amount of rotational distance of said drum;

movable means coupled adjacent said cylinder for receiving said signatures from said drum surface in a first or second position in a receiving area relative to said magazine signature position;



signature drive means for driving said movable means for moving signatures; and

finger means connected to said movable means, adjustable to a first position for moving signatures in a first direction and to a second position for moving signatures in an opposite direction.

3,938,800

SUCTION HEAD FOR SHEET FEEDING APPARATUS

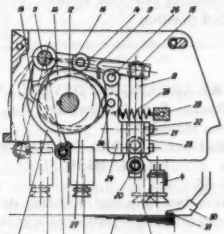
Arno Wirz, Bammental, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Continuation of Ser. No. 352,191, April 18, 1973, abandoned. This application Oct. 3, 1974, Ser. No. 511,688

Claims priority, application Germany, Apr. 26, 1972, 2220353

Int. Cl.² B65H *3/08*

U.S. Cl. 271—93 **10 Claims**



1. A suction head for feeding sheets to further sheet transporting means comprising suction separation means for lifting sheets off a pile of sheets, transport suction means for taking over the sheet lifted by the suction separation means, said transport suction means being movable over a given transport distance for advancing the sheet in a transport direction towards said further sheet transporting means, and control means for moving said suction separation means in said transport direction over a distance shorter than said transport distance simultaneously with and at the same velocity as said transport suction means, whereby said separation suction means assist said transport means in transporting the lifted sheet over said shorter distance.

3,938,801

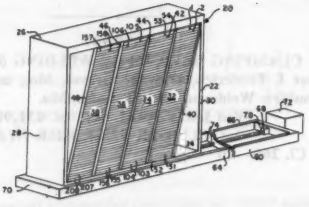
CONTINUOUS OPERATING COLLATOR

David H. Holliday, 21315-80th West, Apt. 11, Edmonds, Wash. 98020

Filed Aug. 19, 1974, Ser. No. 498,454

Int. Cl.² B65H *31/24*

U.S. Cl. 271—173 **29 Claims**



1. A collator comprising:

a. at least two columns identified as a first column and a second column,

b. each column having a plurality of bins;

c. said columns being juxtapositioned to each other;

d. said columns being on a bias at a slant;

e. said bins being, substantially, horizontal;

f. an upper bin, partially, overlying the next lower bin and, partially extending over the next lower bin; and,

g. the top bins in the second column overlying, substantially, the lowest bin in the first column.

3,938,802

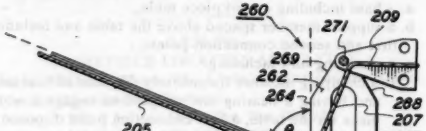
SHEET STACKING APPARATUS

Robert E. Hartman, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 319,956, Dec. 29, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,691

Int. Cl.² B65H *31/36*

U.S. Cl. 271—220 **2 Claims**



2. In a sorting apparatus in which copy sheets are sorted into tray members moved past a sheet path, wherein each tray member is arranged with a first tray portion inclined to the horizontal plane on which sides of copy sheets are received and a second tray portion against which edges of the copy sheets are received, the improvement comprising:

a frame,

at least one light weight plate member located on said frame at the termination of the sheet path at an acute angle to said first tray portion,

said plate member being pivotable on an axis parallel to and adjacent to said second tray portion to move relative to the tray member whereby a copy sheet entering the tray member strikes said plate member transferring kinetic

energy to rotational kinetic energy which is absorbed by the topmost sheets in said tray member upon return of said plate member to its rest position,

wherein said plate member is in the shape of a polygon which is relatively thin, said polygon having a leading edge in the sheet path forming said acute angle with said first tray portion,

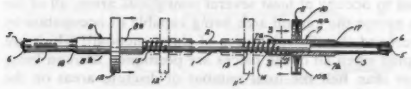
wherein said acute angle decreases as the tray member fills with copy sheets whereby curling of sheets along said second tray portion is minimized.

3,938,803

DUAL PURPOSE EXERCISING DEVICE

Robert B. Wilmoth, and Warren J. Wilmoth, both of 3802 Bobbie Lane, Garland, Tex. 75042

Filed Aug. 1, 1974, Ser. No. 493,581
Int. Cl.² A63B *21/22, 23/02*
U.S. Cl. 272—57 J **1 Claim**



1. An exercise device comprising: an elongated cylindrical bar having a smooth outer surface; a pair of hand grips; an abutment on each of said hand grips, one of said hand grips being secured to each end of said bar such that each of said abutments is positioned intermediate opposite ends of said bar; a pair of tubular sleeves having inner and outer ends, each of said sleeves having a bore extending therethrough, said bar being telescopically disposed in said bores, each of said sleeves having an enlarged counterbore formed in inner ends thereof, said bore and counterbore in each of said sleeves being concentric forming a shoulder inside each of said tubular sleeves intermediate opposite ends of said sleeves; a coiled spring having a central passage, said bar extending through said central passage, said spring having ends extending into said counter bores and into abutting relation with said shoulders such that an outer end of each of said sleeves is urged into engagement with one of said abutments on said hand grips secured to opposite ends of said bar; a pair of wheels; and means rigidly securing one of said wheels to each of said sleeves, each of said wheels being spaced from the outer end of each of said sleeves to provide an extension between the outer end of each of said sleeves and each of said wheels, said extensions being adapted to be gripped by human hands to urge said sleeves inwardly along said bar to move outer ends of said sleeves out of engagement with said abutments on said hand grips on opposite ends of the bar.

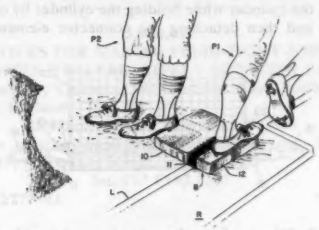
3,938,804

SAFETY BASE FOR ATHLETIC EVENTS

Arthur Eugene Willett, 5902 Arapahoe Terrace, Forest Heights, Md. 20021

Continuation-in-part of Ser. No. 415,835, Dec. 10, 1973, abandoned. This application Apr. 17, 1975, Ser. No. 569,304
Int. Cl.² A63B *69/40*
U.S. Cl. 273—25 **4 Claims**

1. A safety base for the first base position of softball and baseball playing fields, comprises an elongate, rectangularly shaped base having a first end portion of the size and shape of a conventional softball and baseball base for disposition in a conventional position in the infield at the first base position, an integral, extended end portion for placement across and outside the base line to thus present an extended end portion of the base to a player running toward the base, which extended end portion may be tagged by the runner, thereby significantly reducing the danger of collision between the runner and another player attempting to get the runner out at the base, said extended end portion comprising a second portion which has a length substantially the same as the width of the base line and is adapted to overlie the base line, and a third portion which is adapted to extend outwardly of the base



line, said first and third portions being readily visually distinguishable one from the other and said second portion being readily visually distinguishable from the first and third portions.

3,938,805

GOLF ACCESSORY

Kei Sakuma, 10-Go, 14-Ban, 5-Chome, Sendagi, Bunkyo, Tokyo, Japan

Filed July 23, 1974, Ser. No. 491,665
Claims priority, application Japan, July 24, 1973, 48-87624[U]; Dec. 9, 1973, 48-144466[U]
Int. Cl.² A63B *57/00*
U.S. Cl. 273—32 A **7 Claims**

1. A golf accessory comprising:

a green marker of a Velcro fastener material;

a retaining element of a Velcro fastener material for retaining said green marker;

a base member fixedly secured to said retaining element and having a protecting means for protecting said green marker from being accidentally brushed off when retained; and

an adhering means attached to said base member for adhering said base member to a suitable position comprising a layer of pressure-sensitive adhesive and a release paper attached thereto.

3,938,806

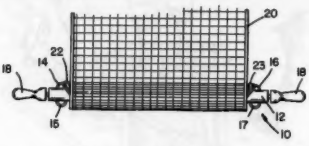
NET AND PORTABLE NET ROLLER

Kelly Husbands, 600 Urbano, San Francisco, Calif. 94127

Filed Dec. 11, 1974, Ser. No. 531,584
Int. Cl.² A63B *71/00*
U.S. Cl. 273—95 R **4 Claims**

1. Apparatus for putting up and taking down game nets such as volley ball net comprising a net having connector elements of a first type fixed to the upper and lower margins of the net at each end for attachment of the net to spaced support members, a portable cylinder having a length at least as great as the width of said game net, at least one connector element of a second type complementary to the connector elements of the first type fixed to each end of the cylinder, and a pair of

handles rotatably mounted to the ends of the cylinder, so that the net can be taken down by detaching the connector elements of the first type at one end of the net from one support member and reattaching the detached connector elements to the respective connector elements on the cylinder, rolling the net onto the cylinder while holding the cylinder by one of the handles, and then detaching the connector elements at the



other end of the net from the other support member, and the net thereafter can be put up by connecting the connector elements at the other end of the net to one or the other of the support members, grasping the handles while moving toward the remaining support member to allow the net to unroll from the cylinder, and connecting the connector elements at said one end of the net to the other support member.

3,938,807

BALL GAME WITH SHIFTABLE LABYRINTHINE PLATFORM

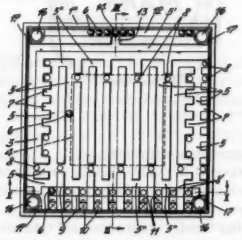
Hanspeter Lüthi, Maurstrasse 58, CH-8117 Fallanden, and Werner Dubach, Illnauerstrasse 32, CH-8307 Effretikon, both of Switzerland

Filed Dec. 27, 1974, Ser. No. 536,763

Claims priority, application Switzerland, Jan. 4, 1974, 54/74

Int. Cl.² A63F *7/16*

U.S. Cl. 273—110 **10 Claims**



1. A ball game comprising a housing having a transparent cover, a labyrinthine platform in said housing, a plurality of balls disposed between the cover and the labyrinthine platform, loading means for urging the labyrinthine platform resiliently towards the cover whereby the cover and the platform may engage the opposite diametrical portions of at least one of said balls, and actuating means connected to the labyrinthine platform and accessible externally of said housing for manual shifting of said labyinthine platform against the action of its loading means and thereby releasing said at least one engaged ball.

3,938,808

GAME APPARATUS INCLUDING BOARD AND PIECES

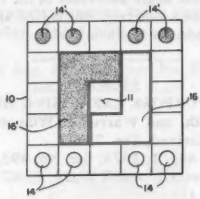
William E. Bockmon, Jr., Louisville, Ky., assignor to Gamut Games, Inc., Shepherdsville, Ky.

Filed Jan. 30, 1975, Ser. No. 545,665

Int. Cl.² A63F *3/00*

U.S. Cl. 273—131 BA **5 Claims**

1. A game for plural participating players including a gameboard having multiple discrete areas disposed in rows and columns, each row and each column having an odd number of areas so that there is on the board one central discrete area, the areas being symmetrically disposed as viewed by each of the players; and differently colored sets of pieces for the different players, each set including a fixed number of pawns each occupying one discrete area and including a knight



shaped to occupy at least several contiguous areas, all of the areas except the central area being capable of occupation by a piece and the discrete areas of the gameboard which are occupied when all of the pieces are positioned thereon being greater than half the total number of discrete areas on the gameboard but never including the central area.

3,938,809

GOLF GAME

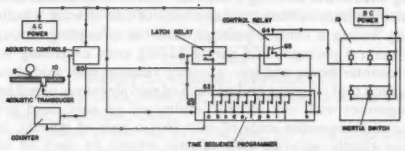
Joseph A. Gentiluomo, 1456 Belmont Ave., Schenectady, N.Y. 12308

Division of Ser. No. 204,890, Dec. 6, 1971, Pat. No. 3,784,207.

This application Sept. 28, 1973, Ser. No. 401,615

Int. Cl.² A63B *69/36*, *67/02*

U.S. Cl. 273—176 FA **6 Claims**



1. A golf game apparatus, comprising a golf ball tee from which golf balls are hit, an upright target for halting balls propelled from said tee, and ball momentum determining and indicating means functionally associated with said tee and said target to provide a numerical momentum magnitude representation for each ball propelled toward said target with either tee or fairway type golf clubs; said ball momentum determining and indicating means include time sequence signal producing means for providing one or more pulses of which each pulse represents a predetermined increment of ball velocities, and a remotely interconnected numeric indicating device operative in receiving and translating said pulses to provide a numeric display of said momentum magnitude representation.

3,938,810

CENTER HOLE FORMATION IN AN INFORMATION STORING DISC

Michel Pradervand, Geneva, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,605

Claims priority, application United Kingdom, Apr. 19, 1972, 18043/72

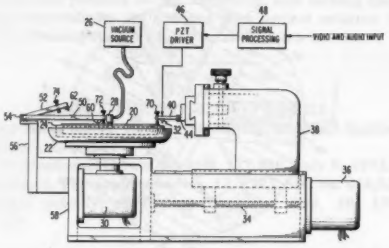
Int. Cl.² G11B *17/06*

U.S. Cl. 274—13 R **5 Claims**

1. Apparatus for providing a centrally apertured disc with a replica disc center hole edge locator concentric with a spiral information groove, said apparatus comprising:

a turntable for receiving a centrally apertured disc and causing rotation thereof;

inscribing means, mounted with respect to said turntable so as to be subject to engagement with a surface of a disc during rotation thereof by said turntable, with said engagement being maitnained at a fixed distance from the center of rotation of said disc so that said inscribing means serves to cut, in a region of said disc surrounding and spaced from the central aperture thereof, a closed circular groove of a predetermined depth and a first



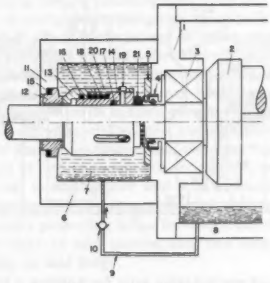
diameter, centered about said center of rotation of said disc; and

means, subject to radial motion with respect to said turntable during said rotation of said disc, for forming an information storing groove in said surface of said disc in a spiral configuration centered about said center of rotation of said disc, with all of the convolutions of said spiral groove having a greater diameter than said first diameter and with the maximum depth of said information storing groove being small relative to said predetermined depth.

3,938,811
SEALING MEANS FOR STIRLING ENGINE CRANKCASES

Ingemar Joel Greis, Dalby, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed Oct. 11, 1974, Ser. No. 514,210
Int. Cl.² F16J *15/00*
U.S. Cl. 277—15 **4 Claims**

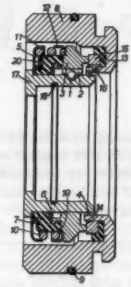


1. A sealing device for preventing leakage of gas through a crank casing wall along a rotatable crank shaft extending therethrough, said crank casing containing gas at a cyclically varying elevated pressure, characterised in that an oil-containing chamber is arranged on the outside of said crank casing wall and surrounding the said crank shaft, said crank casing has an oil sump within said wall, a conduit connects said oil sump of said crank casing with said chamber, a non-return valve being arranged in said conduit allowing flow of oil only in the direction from said sump to said chamber, a one way sealing member about said shaft and located between the shaft and said wall to permit flow of oil in the direction from said chamber into said crank casing, and rotation means being provided for causing rotation of the oil in said chamber in the direction of rotation of said crank shaft.

3,938,812
DEVICES FOR MAKING FLUID-TIGHT JOINTS BETWEEN TWO RELATIVELY ROTATING PARTS

Edgar Padbury Coleman, 197 Tentelow Lane, Southal, Middlesex, England

Filed June 19, 1973, Ser. No. 371,436
Claims priority, application United Kingdom, June 20, 1972, 28719/72
Int. Cl.² F16J *9/00*
U.S. Cl. 277—41 **5 Claims**



1. A gland for making a fluid-tight seal between a casing and a sleeve which are rotatable with respect to each other, said gland comprising a rubbing ring mounted in said casing, a floating ring keyed to said sleeve, a spring acting between said sleeve and said floating ring to urge said floating ring into engagement with said rubbing ring, a sealing ring of fluid-resistant elastomeric material having a first part mounted in a recess in one of said sleeve and said floating ring to form a seal with at least one wall surface of said recess and a second part forming a sliding seal with the surface of the other of said sleeve and floating ring, an L-shaped rubbing ring having first, second and third surfaces, said first surface abutting said floating ring, said second surface substantially parallel to said first surface and adapted to abut a step in said casing when said second surface is urged towards said step, said third surface substantially perpendicular to said second surface and intersecting said second surface, a cuff positioned between said casing and rubbing ring and forming a seal with said third surface of said rubbing ring, said cuff spaced from said second surface of said rubbing ring, the outer diameter of said floating ring where it abuts said first surface of said rubbing ring being greater than the inner diameter of said cuff where it forms said seal with said rubbing ring, whereby fluid pressure in said casing exerts pressure on only said rubbing ring in a sense which tends to increase the contact pressure between said rubbing and sealing rings when said second surface of said rubbing ring is spaced from said step.

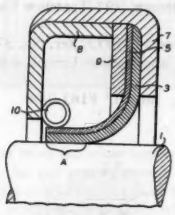
3,938,813
POSITIVE-CONTACT SEAL

Hans Forch, Birkenau, Germany, assignor to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Germany

Filed Aug. 1, 1974, Ser. No. 493,937
Claims priority, application Germany, Aug. 3, 1973, 2339353
Int. Cl.² F16J *15/32*
U.S. Cl. 277—152 **24 Claims**

1. In a sealing assembly for a shaft comprising a housing for a fluid medium, a flexible sealing ring disposed within said

housing and adaptable to be disposed about a shaft in contact therewith, and means for urging said flexible sealing ring into contact with said shaft, the improvement wherein said flexible sealing ring comprises a layer which is impermeable to the fluid medium to be used, said layer in facing relationship to



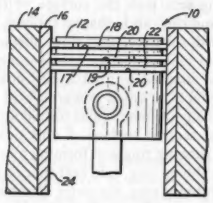
the interior of said housing, said flexible sealing ring having on its exterior surface which is in contact with the shaft free fiber ends, a majority of which are oriented in an axial direction towards the interior of said housing and are disposable in the direction of rotation of the shaft.

3,938,814

BEARING MEMBER HAVING A WEAR RESISTANT COATING ON ITS BEARING FACE

John E. Cromwell, Baltimore, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sept. 23, 1974, Ser. No. 508,245
Int. Cl.² B32B *15/18*; F16J *9/00*
U.S. Cl. 277—235 A **11 Claims**



1. A bearing member having a wear resistant coating applied to a wear surface thereon by plasma spraying a mixture of particles on said wear surface, said mixture comprising by weight:

15–40% intermetallic brazing and binding alloy particles, said particles consisting of:
- 0.18 – 0.48 parts carbon,
- 0.60 – 1.60 parts silicon,
- 2.58 – 6.88 parts chromium,
- 10.50 – 28.00 parts nickel,
- 0.60 – 1.60 parts iron, and
- 0.54 – 1.44 parts boron;

5–30% cobalt molybdenum alloy particles, said cobalt molybdenum alloy particles consisting substantially of 75% cobalt alloyed with 25% molybdenum; and

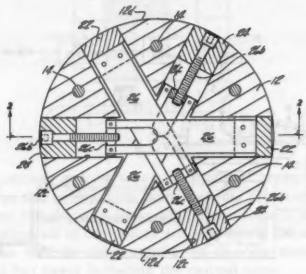
30 – 60% molybdenum particles.

3,938,815

CHUCK HAVING JAW COUNTERBALANCE MECHANISM

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1975, Ser. No. 563,545
Int. Cl.² B23B *31/14, 31/24*
U.S. Cl. 279—1 C **9 Claims**



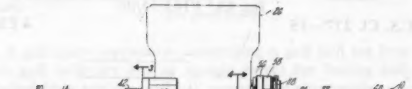
1. A chuck structure comprising a base adapted to be rotated around a central axis; work gripper jaws slidably mounted on said base for radial adjustments toward and away from said central axis; a counterbalance for each jaw; each counterbalance being slidably mounted on the base for movement along a diammetrical line passing through the associated jaw and the central axis; and tensioned connector means joining each jaw with its counterbalance.

3,938,816

CHUCK OF THE INDEXING TYPE

William James Manchester, Durham, Conn., assignor to PowerHold Products, Inc., Rockfall, Conn.

Filed Jan. 22, 1974, Ser. No. 435,435
Int. Cl.² B23B *31/34*
U.S. Cl. 279—5 **9 Claims**



1. A chuck of the indexing type for holding a large workpiece weighing up to about 2,000 pounds comprising a pair of substantially planar support plates rigidly interconnected in spaced parallel relationship and consisting of a base plate and a top plate having an enlarged central aperture of sufficient size to readily permit passage of a workpiece therethrough, a pair of opposed jaw supports mounted between said plates adjacent the periphery of said aperture, a housing for each of said jaw supports fixedly positioned and rigidly supported between said plates, one of said jaw supports being slidably movable within said housing relative to said plates toward and away from the other support, said jaw supports including live centers positioned coaxially along the axis of movement of

said movable support, a jaw mounted on each live center for indexed rotation relative to said supports into any one of a number of indexed rotary positions, a jaw support operator mounted on the housing between said plates and having wedge-like drive means in alignment with said live centers for driving said movable support and associated jaw toward and away from said other jaw and support for clampably engaging and releasing a workpiece positioned between the jaws, and jaw locking means supportably mounted on the base plate and directly engaging the jaws to provide support for the jaws in a direction normal to the base plate and directly opposite machine tool pressure on the workpiece, said locking means rigidly immobilizing the indexed jaws against rotation and readily releasing the jaws for indexed rotation.

3,938,817

CHUCK FOR IMPACT-TYPE DRILL

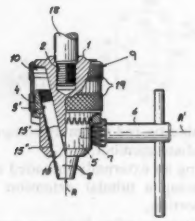
Günter Horst Röhm, Heinrich-Rohm-Str. 50, 7927 Sontheim (Brenz), Germany

Continuation-in-part of Ser. No. 377,730, July 9, 1973, abandoned. This application Nov. 12, 1973, Ser. No. 414,824

Claims priority, application Germany, Nov. 10, 1972, 7241181

Int. Cl.² B23B *5/22*

U.S. Cl. 279—61 **1 Claim**



1. A chuck comprising:

a chuck body adapted to be rotated about an axis and having an axial passage formed with an axially tapered seat;

a plurality of jaws axially slidable on said seat;

a tightening ring surrounding said body and having a conically threaded inner periphery threadedly engaging said jaws for axial displacement of same and a cylindrical outer periphery formed with a sharp-edged shoulder; and

a cylindrical sleeve surrounding said body and having one end plastically deformed over said shoulder, said ring being formed on its outside periphery with an outwardly open circumferential groove, having a pair of flanks, one of said flanks constituting said choulder, said sleeve being formed at said one end with an inwardly projecting ridge received in said groove and a beveled outer edge, said ring being formed at one side of said groove with an outwardly projecting ledge forming a continuation of the other flank of said groove, said one end of said sleeve bearing on said ledge.

3,938,818

DRAW PALLETT AND METHOD OF MAKING SAME

Hermann Studeny, Niederkassel, and Holger Bultmann, St. Augustin, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Feb. 13, 1974, Ser. No. 442,251

Claims priority, application Germany, Feb. 13, 1973, 73053108[u]

Int. Cl.² B62B *15/00*

U.S. Cl. 280—19 **29 Claims**

1. Draw pallet for conveying stackable cargo comprising:

a thin flexible sheet of high strength resinous material, said thin flexible sheet defining perforations therein for accommodating drainage of water therethrough,

and roughening means on one side of said thin sheet for limiting sliding of cargo stacked on said one side.

3,938,819

SLIDABLE MULTIPURPOSE CONTAINER DEVICE

William F. Martin, Ridgewood, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 7, 1974, Ser. No. 521,678

Int. Cl.² B62B *15/00*

U.S. Cl. 280—19 **3 Claims**

1. A slidable multipurpose container device, comprising

a sheet-like bottom having a rounded leading edge;

a sheet-like front affixed to and extending from the bottom at substantially right angles thereto;

a pair of sheet-like sides affixed to the sides of the bottom in substantially parallel spaced relation and extending from the bottom at substantially right angles thereto;

a sheet-like back removably positioned at substantially right angles to the bottom and the sides to form a substantially rectilinear container;

a substantially rod-like member swivelly mounted on the front and extending forward thereof and a loop handle at the free end of the rod-like member; and

track members on the rear ends of the sides in facing relationship removably positioning the back.

3,938,820

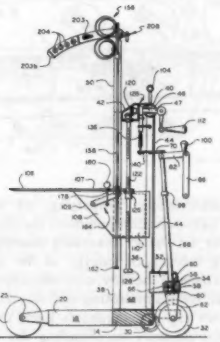
INVALID CART AND LIFT

Herman G. Nabinger, 311 Kirk Ave., Syracuse, N.Y. 13205

Filed Aug. 21, 1974, Ser. No. 499,313

Int. Cl.² B62B *3/12;* **A61G** *7/10*

U.S. Cl. 280—47.11 **8 Claims**



1. An improved invalid cart and lift comprising:

a horizontally disposed frame having a closed end and an end with an opening therein, the opening having a portion of the frame as its opposing side walls;

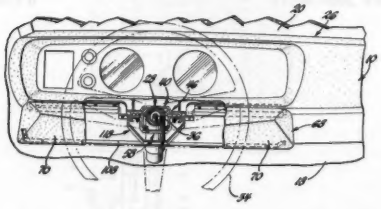
a support wheel rotatably connected to each of the opposing side walls of the opening;
a horizontally disposed platform integral with the closed end of the frame;
a steering wheel supporting the closed end of the frame;
a steering shaft operably connected to the steering wheel and extending upwardly therefrom;
a handle for pulling and steering the cart connected to the upwardly extending portion of the steering shaft, with the handle, the steering shaft and the steering wheel being operably connected so that horizontal movement of the handle results in a corresponding movement of the plane of rotation of the steering wheel;
a housing projecting vertically from the frame;
a seat supported by the housing, the seat being vertically movable for raising and lowering a patient by means including a manually operated crank extending from the housing, a horizontal drive shaft actuated by the crank, a vertical threaded driven shaft, a mitre gear for transmitting the rotation of the drive shaft to the driven shaft, with the mitre gear, the drive and the driven shafts being for the most part contained in the housing, and a ball nut forming a part of the seat, the ball nut being operably connected to the vertical threaded driven shaft whereby rotation of said shaft effects vertical movement of the ball nut and therefore the seat; and
braking means to slow or totally stop the downward vertical movement of the seat, the braking means including a disc operably connected to rotate with one of said drive and driven shafts, a band having two ends with one end anchored securely, the band being wrapped over a portion of the disc, spring means, operably connected to the other end of the band, biasing the band into frictional engagement with the disc, and brake release means which when actuated relieve the biasing effect of the spring means.

3,938,821

OCCUPANT KNEE RESTRAINT

Ronald H. Haas, Okemos, and Roy J. Wohlscheid, Lansing, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 10, 1973, Ser. No. 404,986
Int. Cl. B62d *1/18*; B60r *21/02*
U.S. Cl. 280—87 C **1 Claim**



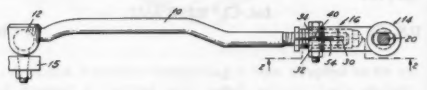
1. The combination comprising, an automotive vehicle including an occupant compartment for supporting a driver in seated attitude, an energy absorbing steering column assembly for absorbing the kinetic energy of the upper torso of said driver when engaged thereby, column support means mounted on the vehicle, means mounting said steering column assembly to said column support means, a knee restraint including a center portion partially surrounding the lower part of said steering column assembly and a pair of knee deformable side portions, each located to one side of said steering column assembly and engageable by the knees of said driver to absorb kinetic energy of the lower torso of said driver and control the kinematics of the upper torso of said driver with respect to said steering column assembly, and rigid generally U-shaped bracket means including a base portion connected to said center portion of said knee restraint below said lower part of said steering column assembly and spaced leg portions, each located to one side of said steering column assembly and secured to said column support means, said bracket means being spaced from said column assembly and blocking deformation of said center portion into said steering column assembly upon engagement of said driver's knees with said knee restraint.

3,938,822

ADJUSTABLE TIE ROD ASSEMBLY

Charles P. Guerriero, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 4, 1974, Ser. No. 512,390
Int. Cl. B62d *7/16*
U.S. Cl. 280—95 R **2 Claims**



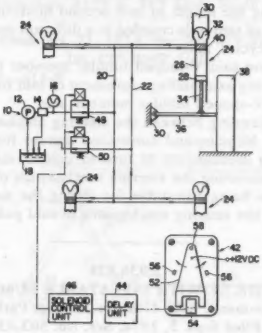
1. An adjustable tie rod assembly comprising a rod, a joint and an intermediate member,
said rod having an externally threaded end portion,
said joint having a tubular extension with an internally threaded portion,
said intermediate member having a generally tubular construction with an internally threaded portion engaging the end portion of said rod,
said intermediate member having an externally threaded portion engaging the internally threaded portion of said tubular extension,
said internally threaded portion of said intermediate member having a different pitch from the externally threaded portion of said intermediate member,
said intermediate member having a tool receiving portion at one of its ends,
said intermediate member being rotatable relative to said rod and said joint whereby the length of said tie rod assembly may be changed,
said tubular extension having an axially extending slot whereby said tubular extension may be reduced in circumferential dimension when subjected to a clamping force,
said intermediate member having an axially extending slot whereby said intermediate member may be reduced in circumferential dimension when subjected to a clamping force,
clamping means engaging said tubular extension constructed to impose a clamping force on said tubular extension and said intermediate member whereby said intermediate member may be held against rotation relative to said rod and said joint,
said clamping means comprising a first flange extending radially from said tubular extension on one side of said slot in said tubular extension and a second flange extending radially from said tubular extension on the other side of said slot in said tubular extension,
said clamping means also including a threaded fastener extending between said first and second flanges and constructed to draw said flanges together when tightened.

3,938,823

FLUID OPERATED VEHICLE BODY LEVEL CONTROL SYSTEM

Mituo Hiruma, Kodaira, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed May 28, 1974, Ser. No. 474,066
Claims priority, application Japan, May 29, 1973, 48-59275
Int. Cl.² B60G 11/28
U.S. Cl. 280—124 F 6 Claims



1. In a fluid operated levelling system of a vehicle body having a source of fluid under pressure connected to a fluid reservoir, the combination comprising:

adjustors operative to raise and lower the vehicle body relative to ground;

levelling valves communicating with the source and the reservoir and being responsive to the tilt of the vehicle body with respect to road surface and operative to communicate the adjustors with the source and the reservoir to move the vehicle body to a level substantially parallel to the road surface;

first electrically controlled normally open valve means connected between the source and inlets of the levelling valves;

second electrically controlled normally open valve means connected between the reservoir and outlets of the levelling valves;

sensing means for sensing the tilt of the vehicle body relative to road surface and generating an electrical tilt representing signal in response to said sensed tilt;

a delay unit connected to the sensing means and including integrating means for integrating said electrical tilt representing signal with respect to time; and

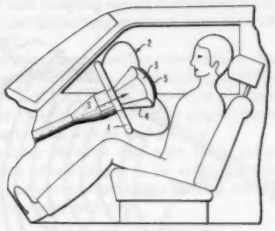
a solenoid control unit connected between the delay unit and the first and second valve means, said solenoid control unit including a level detector responsive to the output of the delay unit and operative to feed said electrical tilt representing signal to the electrically controlled valve means when the integrated level of said electrical tilt representing signal is above a predetermined value for thereby closing said electrically controlled valve means to block fluid communication between the source and the reservoir and the levelling valves.

3,938,824

PROTECTIVE INSTALLATION, ESPECIALLY FOR THE PASSENGERS OF MOTOR VEHICLES

Helmut Patzelt, Feilbach, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 15, 1973, Ser. No. 416,055
Claims priority, application Germany, Nov. 18, 1972, 2256720
Int. Cl.² B60R 21/08
U.S. Cl. 280—150 AB 7 Claims



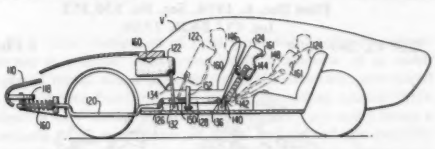
1. In a protective installation, especially for the passengers of motor vehicles, which includes an air bag means automatically inflatable by means of a gas upon exceeding a predetermined vehicle deceleration, and an insert means coordinated to the air bag means which during the inflation is disposed at a distance to the bag bottom, in relation to the main flow direction of the gas and extends essentially transversely to the main flow direction of the gas, said insert means forming in the area thereof disposed in the main flow of the gas a baffle surface for the inflowing gas, and the air bag means being securely connected with the insert means within the area of its bottom facing the passenger, the improvement comprising elastic retaining means for anchoring said insert means at a relatively fixed vehicle part, said elastic retaining means including strips of the fabric material of said air bag means.

3,938,825

VEHICLE SAFETY APPARATUS

George T. Boswell, 6710 Kenmont Place, Springfield, Va. 22151

Continuation of Ser. No. 201,803, Nov. 24, 1971, abandoned.
This application Dec. 14, 1973, Ser. No. 424,686
Int. Cl. B60r 21/10
U.S. Cl. 280—150 B 13 Claims



1. Safety apparatus for a vehicle having a passenger seat, comprising an energy absorbing panel positioned in front of the seat and movably mounted on the vehicle for movement between a first position wherein said energy absorbing panel is spaced from the occupant of the seat and a second position wherein said energy absorbing panel is positioned closely adjacent to and in front of the occupant of the seat, bumper means movably mounted on the vehicle, a linkage connecting said bumper means to said energy absorbing panel, said linkage being operable to effect movement of said energy absorbing panel from said first position to said second position in response to inward movement of said bumper means caused by an impact thereon to restrain forward movement of the occupant of the seat before significant forward body movement of the occupant in response to the force of the impact,

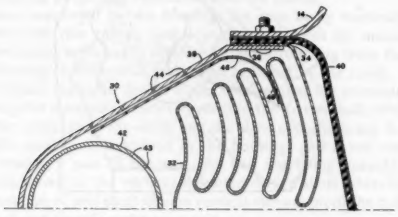
and means for retaining said energy absorbing panel in said second position during the impact.

3,938,826

ASPIRATED VEHICLE OCCUPANT RESTRAINT SYSTEM

Gerardo Giorgini, Moncalieri, Turin, and Giorgio Bocca, Chivasso, both of Italy, assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 7, 1974, Ser. No. 440,604
Int. Cl.² B60R 21/08
U.S. Cl. 280—150 AB **14 Claims**



1. In an aspirated vehicle occupant restraint system including a housing, a confinement having a collapsed condition in which it is located in the housing and an expanded condition for restricting movement of an occupant in the passenger compartment of the vehicle, means for expanding the confinement from the collapsed condition to the expanded condition and aspirator means fixed in said housing having an inlet in fluid communication with the confinement, the improvement comprising:

flap means attached to the inner surface of the confinement wall intermediate the margins thereof, said flap means

i. normally closing the inlet of the aspirator means when the confinement is in the collapsed condition, and

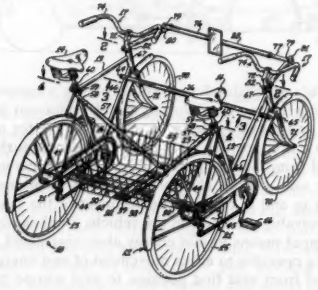
ii. being progressively moved to expose the inlet of the aspirator means by movement of the confinement wall as the confinement moves from the collapsed condition to the expanded condition.

3,938,827

BICYCLE INTERCONNECTING APPARATUS

Charles L. Johnson, 4235 E. McDowell Road, Space No. 100, Phoenix, Ariz. 85008

Filed Dec. 6, 1974, Ser. No. 530,352
Int. Cl.² B62K 13/06
U.S. Cl. 280—209 **6 Claims**



1. An apparatus for interconnecting a pair of bicycles comprising:

a) a pair of bicycles positioned in a side-by-side relationship, each of said pair of bicycles having a frame, a rear wheel axle, a seat and a steering mechanism;

b) a first interconnecting bar extending between said pair of bicycles and coupled on the opposite ends thereof to the frames of said bicycles adjacent the rear wheel axles thereof;

c) a second interconnecting bar extending between said pair of bicycles and coupled on the opposite ends thereof to said pair of bicycles adjacent the seats thereof, said second interconnecting bar comprising,

a V-shaped hollow tubular member a portion intermediate the opposite ends of which is connected to said first interconnecting bar,

a rod axially slidably mounted in each of the opposite ends of said V-shaped hollow tubular member for adjusting the length of said second interconnecting bar, each of said rods coupled to a different one of said pair of bicycles, and

means on said V-shaped tubular member for optionally allowing axial sliding movement of said rods relative to said V-shaped tubular member; and

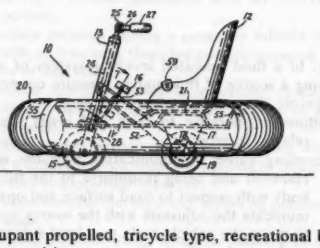
means extending between the steering mechanisms of said pair of bicycles and connected thereto for causing the steering mechanisms to turn in unison, said means for interconnecting the steering mechanisms of said pair of bicycles being adjustable for setting the toe-in relationship of the steering mechanisms of said pair of bicycles.

3,938,828

VEHICLE WITH INFLATABLE BUMPER

John W. Hammond, 9805 47th Ave., College Park, Md. 20740

Filed Sept. 5, 1974, Ser. No. 503,434
Int. Cl.² B62M 1/02
U.S. Cl. 280—261 **7 Claims**



1. An occupant propelled, tricycle type, recreational bumper vehicle comprising:

a. a floorboard;

b. a seat attached to said floorboard;

c. a steering column assembly attached to and extending through said floorboard to engage;

d. a front axle, supported by;

e. a front wheel;

f. a foot powered propulsion assembly attached to said steering column assembly;

g. at least two rear axle support bracket assemblies attached to said floorboard and supporting;

h. a rear axle assembly supported by;

i. two rear wheels;

j. a sprocket chain engaged between said foot powered propulsion assembly and said rear axle assembly whereby mobility for said vehicle may be obtained;

k. a safety guard for covering said sprocket chain in the area above said floorboard;

l. an inflatable bumper removably attached to the outside periphery of said floorboard;

m. said steering assembly comprising;

n. a shaft housing assembly;

o. a steering shaft, having at one end;

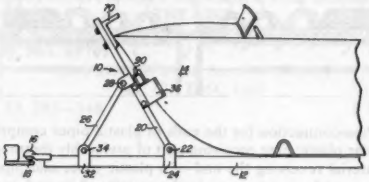
p. a gooseneck clamp, engaging;
q. a pair of handlebars, having;
r. handgrips;
s. said steering shaft having at its other end a "U" shaped fork;
t. said shaft housing assembly comprising;
u. a tube, having;
v. a stepped bore therethrough for bearing engagement with the steering shaft; and
w. said tube being attached at its lower end to a plate having an aperture therethrough for connection to the floorboard.

3,938,829

BOAT TRAILER LATCHING DEVICE

James D. Anderson, 4339 S. 850 East, South Ogden, Utah 84403

Filed Oct. 21, 1974, Ser. No. 516,277
Int. Cl.² B60P *3/10*
U.S. Cl. 280—414 R **13 Claims**



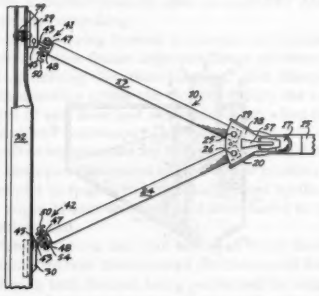
1. A boat latching device comprising an upstanding support member, a bow stop member slidably biased to the upper end of said upstanding support member, a bow conforming guide member fixed to said upstanding support member below said stop member and a means for automatically latching the bow of a boat to said upstanding support member.

3,938,830

TOW BAR ASSEMBLY

Oscar B. Lane, 1030-3rd Ave. S., Nashville, Tenn. 37210

Filed Oct. 16, 1974, Ser. No. 515,163
Int. Cl.² B60D *1/16*
U.S. Cl. 280—493 **2 Claims**



1. A tow bar assembly adapted to be attached to the front portion of a trailing vehicle, for towing by a towing vehicle having a draft hitch member, comprising:

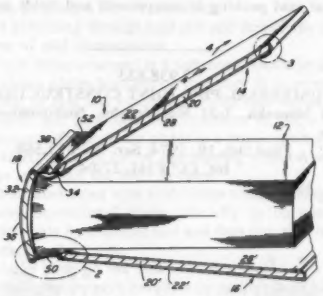
a. a cooperative hitch member adapted to detachably couple with said draft hitch member in operative position,
b. a pair of elongated draft bars having leading and trailing end portions,
c. means pivotally connecting each of said leading end portions to said cooperative hitch member to permit pivotal movement of said draft bars in a substantially horizontal plane when said hitch members are coupled in operative position,
d. an attachment member for each draft bar, each of said attachment members having means for detachable connection to a trailing vehicle,
e. coupling means connecting the trailing end portion of each draft bar to a corresponding attachment member,
f. each of said coupling means comprising a pair of laterally spaced ears projecting rearward from each of said trailing end portions,
g. said coupling means further comprising a tongue projecting forward from said corresponding attachment member between said ears, and a transverse pin connecting said ears and said tongue for relative pivotal movement about the longitudinal axis of said pin,
h. the spacing between said ears being greater than the dimension of said tongue in the same direction as said ear spacing, to permit translatory shifting movement of said tongue between said ears.

3,938,831

METAL COVERED BOOKS

Walter H. Herman, Rose Valley, Pa., assignor to Franklin Mint Corporation, Franklin Center, Pa.

Filed July 11, 1974, Ser. No. 487,483
Int. Cl.² B42D *3/00*
U.S. Cl. 281—29 **4 Claims**



1. A book comprised of rigid front and back covers connected to a spine, each cover being a laminate of an outer layer of metal and a hard non-metallic substrate, said metal layers of said front and rear covers extending around three edges of said hard non-metallic substrates, said spine being a laminate of an outer layer of metal and a hard non-metallic substrate, two fabric hinges, each fabric hinge being connected to one of said covers and to said spine, four elongated metal clips, each of said clips extending substantially throughout the entire height of said book, two of said clips being embedded in said spine between said layer of metal and said substrate and being exposed along both side edges of said spine, each of the other two of said clips being embedded in a different one of said covers between said layers of metal and said substrates and being exposed along the edge of each of said covers adjacent said spine, two hinges of flexible metal mesh overlying said fabric hinges, each said metal mesh hinge having an exposed outer surface of metal, each metal mesh hinge being connected along one side edge portion to the metal clip of one of said covers and along an opposite side edge portion to the metal clips of said spine to form metal mesh hinges between the spine and the covers whereby the

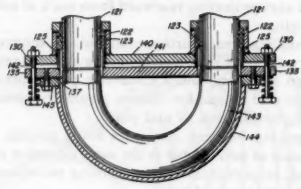
entire outer surfaces of said covers, spine and hinges are metal.

3,938,832

PACKING GLAND FOR $TiCl_4$ INLET TO OXIDIZER REACTOR

Peter Joseph Preston, Savannah, Ga., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 1, 1974, Ser. No. 520,089
Int. Cl.² F16L 55/00
U.S. Cl. 285—157 7 Claims



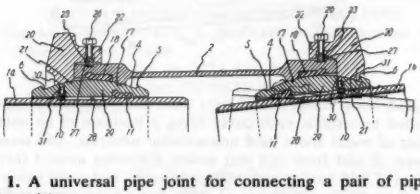
1. A coupling for a U-bend in a brittle pipe comprising a flanged housing means for a brittle U-bend of pipe, a flanged follower plate removably secured to said housing flange, said flanged follower plate having follower sleeves opposite the ends of said pipe U-bend, a flanged plate carrying two packed sleeves and adapted to fit over said follower and be secured to said follower plate, said packed sleeves containing packing rings, each packed sleeve containing a brittle pipe, and means to urge said follower flange toward said packed sleeve flange such that said packing is compressed and holds said brittle pipes.

3,938,833

UNIVERSAL PIPE JOINT CONSTRUCTION

Tadashi Miyaoka, 7-31 Horikiri-cho, Nishinomiya, Hyogo, Japan

Filed Oct. 10, 1974, Ser. No. 513,568
Int. Cl.² F16L 27/04
U.S. Cl. 285—166 7 Claims



1. A universal pipe joint for connecting a pair of pipes comprising:

a pair of articulation rings each having a spherical convex outer surface portion and a cylindrical inner surface portion adapted to fit over one of the pipes, and a sealing member interposed between each articulation ring and the pipe associated therewith;

means for attaching one of the articulation rings to each one of the pipes comprising an annular groove formed in the inner surface of the articulation ring, a first split lock ring adapted to fit in said groove, an annular recess formed in the outer surface of the pipe associated with such one articulation ring, and means for engaging the first lock ring in said recess by decreasing the diameter of the first lock ring;

a joint pipe having at each end thereof an annular concave inner surface adapted to engage a portion of the convex outer surface of one of the articulation rings, and a second sealing member interposed between the convex outer surface of each articulation ring and the joint pipe; and,

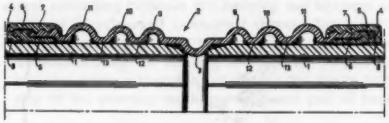
a pair of separation preventive rings, and means for attaching the separation preventive rings to the joint pipe at the ends thereof, each separation preventive ring having an annular concave inner surface which is adapted to engage a portion of the convex outer surface of one of the articulation rings in an axial direction opposite to the concave inner surface of the joint pipe engaging such one articulation ring.

3,938,834

PIPE CONNECTION FOR PLASTIC PIPES COMPRISING A TRANSVERSELY OR HELICALLY CORRUGATED PIPE-CONNECTING PART

Albertus Antony Oostenbrink, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Apr. 20, 1973, Ser. No. 353,080
Int. Cl.² F16L 21/02
U.S. Cl. 285—235 7 Claims



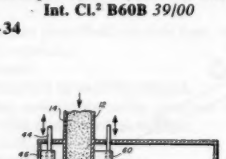
1. Pipe-connection for the ends of plastic pipes comprising a tubular plastic pipe receiving part of preferably thermoplastic material receiving the end of a plastic pipe, said pipe receiving part having a recess in the vicinity of its end, sealing means accommodated in said recess, the receiving part having a substantially uniform wall thickness and at least two continuous annular corrugations being contiguous with the inserted pipe spaced inwardly of said recess, the cross section area of the corrugations between the corrugations and the pipe decreasing from the end of the receiving part, and the corrugations have a different radius of curvature for obtaining the different cross section areas and the inner diameters of the hollows between the corrugations being equal.

3,938,835

DOUBLE ACTION WINTER ROAD CONDITIONER APPARATUS

Poy Lee, 52 Tennyson St., Somerville, Mass. 02145

Filed Sept. 12, 1974, Ser. No. 505,486
Int. Cl.² B60B 39/00
U.S. Cl. 291—34 6 Claims



1. An apparatus for use with a motor vehicle for improving the traction of the vehicle especially when traveling on ice covered highways or the like comprising;

a housing associated with at least one wheel of the vehicle and having means defining an inlet port at the top of the housing for receiving sand and an outlet port at the bottom of the housing,

a wall for separating the housing into first and second compartments and defining at least in part an inlet passage and an outlet passage to the second compartment,

said receiving means of the housing defining a chamber having an inlet to the first compartment,

first valve means operable to permit sand to flow from the sand receiving means, via the inlet to the first compartment and through the first compartment to the outlet in the housing,

and second valve means including two closure members and means commonly supporting the closure members,

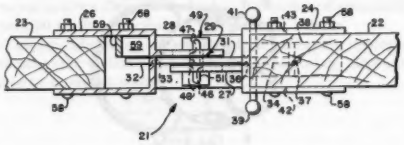
whereby in a first position one closure member is open and the other closure member is closed to permit sand to flow from the sand receiving means via the inlet passage to the second compartment, and in a second position the one closure member is closed and the other closure member is open to permit sand to flow from the second compartment via the outlet passage to the outlet of the housing.

3,938,836

HIGH STRENGTH BOLT ASSEMBLY FOR DOORS AND THE LIKE

Donald V. Smith, Northern Nevada Childrens Home, Carson City, Nev. 89701

Filed July 12, 1974, Ser. No. 487,997
Int. Cl.² E05C *1/04*
U.S. Cl. 292—148 **5 Claims**



1. In a high strength bolt assembly for positive securement of a door, window or the like, said assembly including a pair of assembly mounting elements with a first of said elements being formed for mounting to said door proximate a door frame and a second of said elements being formed for mounting to said door frame proximate said first of said elements, and a bolt mounted to one of said elements for movement to and from a bolted position and an unbolted position, the improvement comprising:

said elements being formed to provide, as mounted on said door and door frame, adjacent flange portions defining a bolt receiving slot therebetween, said flange portions each spanning across the slot defined by the confronting edges of said door and said door frame when said door is in a closed position;

said bolt being mounted for movement into said bolt receiving slot upon movement to said bolted position and being mounted to span across the slot defined by the confronting edges of said door and said door frame in said bolted position; and

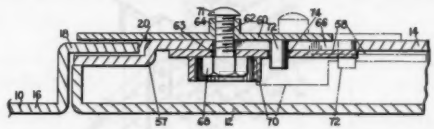
said flange portions and said bolt each being formed with a channel therein dimensioned for receipt of lock means, and each said channel being positioned for aligned registration of all of the channels in a direction extending substantially parallel to the slot defined by the confronting edges of said door and door frame upon closing of said door and movement of said bolt to said bolted position, said elements being further formed and said channels oriented for positioning of said lock means therethrough for access to said lock and unlock the same from both sides of said door.

3,938,837

SAFETY LOCK FOR ENCLOSURES

William L. Bright, 0605 SW. Curry St., Portland, Oreg. 97201

Division of Ser. No. 230,223, Feb. 29, 1972, Pat. No. 3,791,683. This application Dec. 3, 1973, Ser. No. 421,446. The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.
Int. Cl.² E05C *1/04*
U.S. Cl. 292—149 **1 Claim**



1. An enclosure comprising

a. defining walls with at least one of said walls having a door opening therein and an inwardly disposed offset flange adjacent said opening parallel with said wall in which said opening is provided,

b. a door in said opening having opposite face surfaces and having a portion thereof overlapping said flange in its closed position,

c. a pair of clamp plates on opposite face surfaces of said door,

d. said plates having a slidable mounted engagement on said door in an arrangement whereby one of said plates is movable into and out of overlapping relation with said flange on the opposite surface of said flange from the door,

e. means defining a slot in said door,

f. a bolt extending through said slot and threadedly engaged in one of said clamp plates,

g. said bolt being arranged in a tightened condition to clamp said clamp plates together on said door in an overlapping position of said one clamp plate with said flange to lock the door and in a loosened condition to allow slidable movement of said clamp plates to a position wherein said one clamp plate is out of overlapping position with said flange to permit the door to open,

h. the bolt associated with said clamp plates having a head of non-conventional shape whereby to be capable of rotation only by a special tool and thus non-removable by unauthorized persons,

i. the clamp plate on the bolt head side including a protective wall portion peripherally surrounding said bolt head and open at the open end,

j. said wall portion defining a socket which is at least as deep as the thickness of the bolt head to prevent side engagement of the bolt head by unauthorized persons and which is of greater diameter than said bolt head to permit removal of the bolt by a special tool inserted through the open end of the protective wall portion.

3,938,838

SLIDING DOOR LOCK

Lee Wesley Brakensiek, 10508 Rancho Road, La Mesa, Calif. 92041

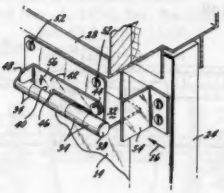
Filed July 15, 1974, Ser. No. 488,706
Int. Cl.² E05C *3/04*
U.S. Cl. 292—210 **2 Claims**

1. An improved locking apparatus for a slidable door panel, said panel slidable within upper and lower channels of a door casing comprising:

a base member fixedly attached to the outer surface of said upper channel parallel to and remote from said slidable door panel;

a leaf member having a hinged attachment to said base member of movement from a first position where said leaf member hangs downward by the force of gravity and is

substantially an extension of said base member to a second position inwardly toward said slidable door panel where said leaf member is substantially perpendicular to said base member, a section of the hinge of said leaf member having a cutaway portion, one edge of said cutaway portion being positioned adjacent said base member when said base member is in said second position; and



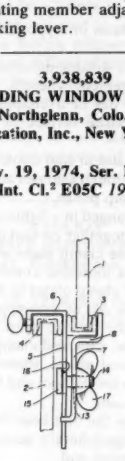
a locking lever positioned parallel to the surface of said base member and pivotable about its end attachment thereto, said locking lever having a downward extending tab portion on its end remote from its attachment end for abutting said one edge of said cutaway portion and holding said leaf member in said second position and an outward extending actuating member adjacent said tab for actuation of said locking lever.

3,938,839

SLIDING WINDOW LOCK

William S. Collier, Northglenn, Colo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 19, 1974, Ser. No. 525,158
Int. Cl.² E05C *19/18*
U.S. Cl. 292—258 **1 Claim**



1. A sliding window lock for a sliding window having a pair of substantially parallel units each of which is slidable, relative to the other and which are positionable with a first of the units having a bottom edge portion and the second of the units having a top edge portion overlapping the bottom edge portion of the first unit, said lock comprising

a substantially plate-like clip member bent at one end at substantially right angles to the remainder thereof to form a head part, the clip member being positioned inside the window between the first and second units with the head part thereof fitting over the edge of one of the units, said clip member having a slot formed therethrough in the remainder thereof and extending longitudinally therealong and serrations formed in the surface of said clip member along the slot and extending from both longitudinal edges of the slot substantially perpendicularly thereto;

a substantially elongated clamp member bent at one end at substantially right angles to the remainder thereof to form a first head part, bent at the first head part at substantially right angles to the remainder of the head part to form a lip, and bent at an opposite end at substantially right angles to the remainder thereof to form a second head part extending in a plane substantially parallel to the first head part, the first and second head parts extending in opposite directions from the remainder of the clamp member, said second head part having a free edge and a cutout formed therein for accommodating the clip member, the clamp member being positioned inside the window in operative proximity with the clip member with the first head part thereof fitting over the edge of the other of the units bordered by the lip thereof, said clamp member having a bore formed through the remainder thereof; and

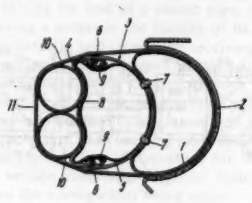
fastening means for releasably affixing the clamp member to the clip member inside the window thereby preventing relative movement of said members and said window units, said fastening means comprising a bolt passing through the slot and the bore and having a head with a serrated undersurface in abutment with the serrations in the surface of the clip, and a wing nut threadedly coupled to the bolt and releasably securing said bolt.

3,938,840

SHOCK ABSORBER FOR A VEHICLE

Ernst-Günter Haase, Egmating, and Rudolf König, Ottobrunn, both of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Germany

Filed Mar. 28, 1974, Ser. No. 455,895
Claims priority, application Germany, Apr. 3, 1973, 2316503
Int. Cl.² B60R *19/08*
U.S. Cl. 293—71 P **1 Claim**

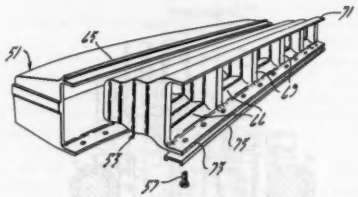


1. In a shock absorber assembly for a vehicle, such as a bumper member for a vehicle, including a flexible closed hollow body arranged to be filled with a flowable, highly compressible fluid medium, such as air, said hollow body arranged to absorb impact forces, and a first rigid support member extending along and disposed in juxtaposition with said hollow body, a second support member arranged on the opposite side of said hollow body from said first support member, wherein the improvement comprises that said second support member is a rigid closed hollow vessel and is disposed in juxtaposition with said hollow body substantially complementary to said first support member, means establishing communication between said second support member and said hollow body so that said second support member acts as an equalizing vessel for receiving the fluid medium from said flexible hollow body when such hollow body is compressed under the application of shock forces directed against the shock absorber assembly and being transmitted to said hollow body through said second support member, said first support member arranged to be mounted on the understructure of a vehicle body, at least one second flexible hollow body mounted in contact with said second support member on the opposite side thereof from said hollow body located between said first and second support members, a flexible jacket laterally enclosing and disposed in contact with said hollow body between said first and second support members and said second hollow body and also with said second support member and located between the juxtaposed surfaces of said hollow body and said first support and disposed in surface contact with said hollow body and said first support member.

3,938,841
RESILIENT BUMPER ASSEMBLY

Patrick M. Glance, Plymouth, and Marvin A. Maten, Jr., Orchard Lake, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 422,946, Dec. 7, 1973, Pat. No. 3,897,095. This application Jan. 27, 1975, Ser. No. 544,599
Int. Cl.² B60R *19/08*
U.S. Cl. 293—71 R 4 Claims



4. A resilient bumper assembly for an automotive vehicle including:

a rigid elongate backing member extending transversely of the vehicle,

an elastomeric outer shell,

means securing said outer shell to said backing member,

energy absorbing means received within the outer shell and abutting the backing member,

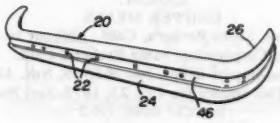
said energy absorbing means including a plurality of elastomeric bellows elements having axes positioned essentially parallel to the direction of travel of the vehicle,

said energy absorbing means having horizontally disposed rectangular bellows-like elements, adjoining elements having common walls.

3,938,842
BUMPER GUARD ASSEMBLY

Edward A. Ruhl, Southfield, Mich., assignor to Robin Products Company, Warren, Mich.

Filed May 20, 1974, Ser. No. 471,784
Int. Cl.² B60R *19/08*
U.S. Cl. 293—71 R 19 Claims

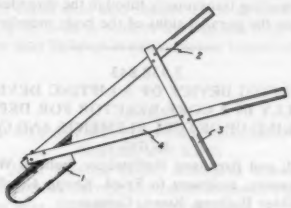


1. A bumper assembly, comprising in combination, an elongated metal bumper, at least one self-supporting impact resistant plastic upright member having a longitudinal axis generally perpendicular to the longitudinal axis of said bumper, said upright member being channel-shaped in transverse cross-section, opening toward said bumper and having integral opposed tab portions extending longitudinally of said bumper and secured to said bumper by connectors generally perpendicular to the longitudinal axis of said bumper, and at least two elongated impact resistant plastic bumper guards, channel-shaped in transverse cross-section and opening toward said bumper, said bumper guards being secured to said bumper on either side of said upright member, said guards lying generally in the longitudinal axis of said bumper and enclosing said upright member tabs adjacent said upright member.

3,938,843
SNOW CRADLE

Otto Andrew Pahl, 36 Worden Road, Scotia, N.Y. 12302

Filed June 26, 1974, Ser. No. 477,489
Int. Cl.² E01H *5/02*
U.S. Cl. 294—54 1 Claim

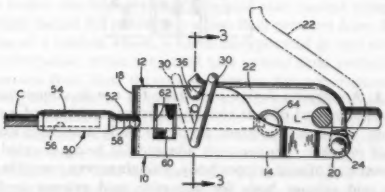


1. A manually operated snow mover comprising a curved wooden scoop, a pair of spaced handle arms fastened to the convex back of the scoop, a lower cutting edge and a leading circular cutting toe on the scoop, the free ends of the arms being spaced apart so the longer flat arm may be placed under a user's arm pit to act as a lever, the other arm having a long handle portion to form one half of a fulcrum and a cross arm with a handle portion connected across the two arms and extending over a considerable distance to be grasped by a user's hand to form the other half of the fulcrum whereby the fulcrum has a circular motion acting as a movable imaginary pivot, the center of this pivot floating up and down and side to side as the snow mover is used in a sweeping motion.

3,938,844
ADJUSTABLE PELICAN HOOK

Curtiss S. Johnson, Jr., Middle Haddam, Conn., assignor to C. Sherman Johnson Co., Inc., East Haddam, Conn.

Filed June 10, 1974, Ser. No. 478,077
Int. Cl.² B66C *1/36*
U.S. Cl. 294—83 R 4 Claims



1. A pelican hook having an adjustment feature comprising:

an elongated U-shaped body member having generally parallel sides connected together at one end and a opening between the sides at the other end;

a jaw member pivotally connected to the body member between the sides at the other end for movement between opened and closed positions;

a catch formed from a ring pivotally mounted in the body member to move into locking engagement with the jaw member in the closed position;

means for holding the catch in locking engagement with the jaw member including a detent mounted on the body member;

an adjustable link including a threaded shaft extending through the body member at the one end and between the sides adjacent the one end, the link also having a fastening for connecting the pelican hook to another article;

means for adjusting the position of the link relative to the body member to increase and decrease the distance be-

tween the fastening on the adjustable link and the jaw member in the closed position, the adjusting means including a rotatable nut on the threaded shaft and captured by the parallel sides of the body member at a longitudinal station on the body member; and

means for limiting the rotation of the threaded shaft relative to the body member, the limiting means including a member extending transversely through the threaded shaft and between the parallel sides of the body member.

3,938,845

GRIPPING DEVICE OF A LIFTING DEVICE, ESPECIALLY IN A CORE REACTOR FOR DEPOSITING AND PICKING UP OF FUEL ELEMENTS AND CONTROL RODS

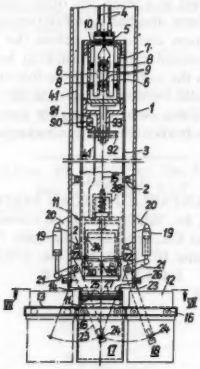
Anton Fehl, and Bernhard Hoffmeister, both of Wilhelmshaven, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Apr. 1, 1974, Ser. No. 456,959

Claims priority, application Germany, Apr. 5, 1973, 2317014

Int. Cl.² G21C *19/10*

U.S. Cl. 294—86 A **39 Claims**



1. A gripping device especially for use in connection with the placement of fuel elements and control bars of a reactor core; a tubular member, a gripper body moveable axially in said member, gripper tools adapted for being coupled to the lower end of said gripper body, a single power operable device in said gripper body for actuating said gripper tools, said gripper tools having like upper and lower guiding means, said upper guiding means being engageable by the lower ends of said gripper body, said lower guiding means being engageable with elements to be placed, said upper guiding means telescopically engaging the lower end of said gripper body, abutment means limiting said telescopic engagement, and connecting means substantially positively connecting the gripper body to a gripper tool in telescopic engagement therewith.

3,938,846

AUTOMATIC LOADER FOR BROACHING MACHINES

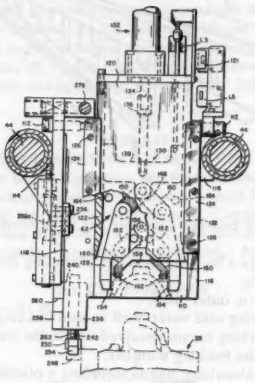
Joseph B. Yuryan, Hudson, Mass., assignor to The LaPointe Machine Tool Company, Hudson, Mass.

Division of Ser. No. 225,090, Feb. 10, 1972, Pat. No. 3,805,944. This application Feb. 1, 1974, Ser. No. 438,733

Int. Cl.² B66C *1/42*

U.S. Cl. 294—106 **13 Claims**

1. A loader for transferring work pieces from a work support to a moving conveyor, wherein a carrier is supported for reciprocation perpendicular to the work support and parallel to the conveyor, positioning means fixed to the carrier, first means for effecting movement of the carrier downwardly relative to the work support to engage the positioning means with the work piece resting on the work support, spaced gripper fingers mounted on the carrier for movement thereon relative to the positioning means from a position in which the fingers are spread apart to a position of engagement with the work piece when the latter is engaged with the positioning means, second means comprising a vertically reciprocable member, a first pair of links pivotally connected at one end to said member and at their other ends to the respective gripper



fingers, a second pair of links pivoted at one end at a predetermined fixed position on the carrier and at their other ends to the respective gripper fingers intermediate the ends of the latter, and means for limiting downward movement of the gripper fingers to a predetermined level wherein the lower ends of the fingers extend below the positioning means opposite the work piece so that further movement of said first means operates to rock the gripper fingers about the second links into engagement with the work piece, said first means being operable thereafter to effect upward movement of the carrier, positioning means, and gripper fingers to lift the work piece from the work support.

3,938,847

GRIPPER MEANS

John J. Peyton, Santa Barbara, Calif., assignor to Industrial Automation Corporation, Santa Barbara, Calif.

Continuation-in-part of Ser. No. 305,709, Nov. 13, 1972, abandoned. This application Oct. 23, 1973, Ser. No. 408,922

Int. Cl.² B66C *1/6.2*

U.S. Cl. 294—110 R **12 Claims**

1. In a bottle handling apparatus, a bottle gripper comprising:

a support means;

first and second gripping members each pivotally supported by said support means, said gripping members being rotatable between a first position whereby the lower portion of said gripping members may engage a bottle neck and a second position not engaging a bottle neck;

spring means for encouraging said gripping members to said first position;

an actuator member moveable between third and fourth positions, said actuator extending upward so as to be engageable from above for encouragement from said third position to said fourth position;

over-center toggle means, said toggle means being coupled between said first and second gripping member and said actuator member, said toggle means being a means for

allowing said first and second gripping members to be moved by said spring means toward said first position as said actuator member moves toward said third position, and for locking said actuator member at said fourth position and said first and second gripping members at said second position by the over-center action of said toggle means, whereby said first and second gripping members will snap to said first position and said actuator member

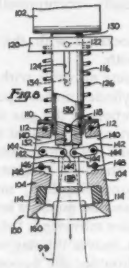


Fig. 6

to said third position as said actuator is encouraged to move from said fourth position;

means for yieldably supporting said support means so that the lower portion of said gripping members may be deflected from their normal positions upon contact with a bottle, the lower portion of said gripping members being chamfered to engage a bottle neck and encourage said gripper and said bottle neck into approximate axial alignment.

3,938,848

METHODS AND APPARATUS FOR THE PNEUMATIC CONVEYING OF MATERIAL

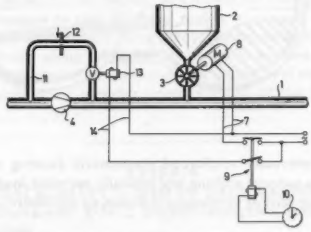
Wolfgang Krambrock, Ravensburg; Paul Lübbehusen, Ravensburg-Durnast, and Hans-Jürgen Huck, Obereschach, all of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Germany

Filed Feb. 19, 1974, Ser. No. 443,243

Claims priority, application Germany, July 6, 1973, 2334360

Int. Cl.² B65G *53/66*

U.S. Cl. 302—42 **12 Claims**



1. A method of pnuematic conveying by air flow of material which tends to form deposits on a conveyor conduit wall and, when given amounts of such deposits have been so formed, to peel off the thus formed deposits from the conduit wall with the probability that such peeled off deposits will form a blockage in the conduit, and wherein the deposit and peeling off process possesses a rhythm cycle specific to the material being conveyed, comprising the steps of automatically alternating conveying phases in which the material is introduced into the conveying air flow and conveyed in continuous flow through said conduit, and cleaning phases in which the introduction of material into the air flow is stopped and only air passed through said conduit for completely removing all material in said conduit, including deposited material, for cleaning said conduit before additional material is introduced into said conduit, and further including the step of alternating said conveying and cleaning phases with a rhythm that is substantially more rapid than said rhythm cycle of material deposit and peeling off so as to remove the deposits from the conduit wall before thay build up in size sufficient to peel off and cause blockage.

3,938,849

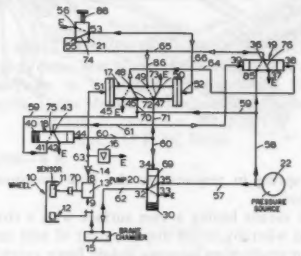
METHOD AND APPARATUS FOR INHIBITING VEHICLE WHEEL LOCKING

Frederick John Charles Hope, Stanyards Farm, Chertsey Road, Chobham, Surrey, and James Malcolm Pigney, Woolhampton Way, Berkshire, both of England

Filed May 29, 1974, Ser. No. 474,421

Int. Cl.² B60T *8/06, 13/16*

U.S. Cl. 303—21 A **30 Claims**



13. In a control system for automatic control of a vehicle braking system to inhibit wheel locking including a fluid pressure actuated brake for braking a vehicle wheel and a conduit through which braking fluid pressure is applied from a source to the brake, the improvement wherein: said control system comprises means for generating a first fluid pressure from the rotation of a vehicle wheel, a valve incorporated in said conduit and capable, when subjected to a second fluid pressure, to interrupt fluid flow therein and means for automatically actuating said valve by subjecting it to said second fluid pressure to periodically interrupt said flow when the first fluid pressure indicates wheel locking, said means including a multi-port fluid valve control device which is fed with said first fluid pressure and with a further fluid pressure dependent on the applied brake pressure, the control device producing said second fluid pressure to actuate said valve and interrupt said flow when said further fluid pressure is greater than the first fluid pressure thereby signifying wheel locking.

3,938,850

BRAKE VALVE FOR A MOTOR VEHICLE BRAKE SYSTEM

James D. Pembleton, Lathrup Village, and Keith C. Pratt, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 30, 1974, Ser. No. 474,509

Int. Cl.² B60T *8/14*

U.S. Cl. 303—24 F **1 Claim**

1. A brake valve for a motor vehicle brake system,

said brake valve having a pressure inlet constructed to be connected to a brake master cylinder and a pressure outlet constructed to be connected to a wheel brake,

said brake valve having a proportioning valve constructed to limit a pressure increase at said outlet relative to a pressure increase at said inlet when the pressure at said

inlet exceeds a pressure determined, in part, by the force exerted by a proportioning valve spring,

a fluid chamber and communicating means connecting said chamber to said inlet,

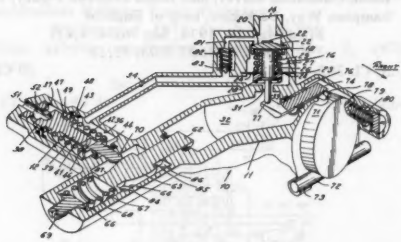
a piston disposed, in part, in said chamber,

a second spring biasing said piston to an at-rest position,

said piston being coupled to a cam means,

said cam means being coupled to said proportioning valve spring and constructed to increase said force exerted by said proportioning valve spring in response to displacement of said piston,

said piston being displaceable in response to fluid pressure in said chamber that exceeds a predetermined minimum pressure that is determined, in part, by the biasing force of said second spring on said piston whereby said cam means increases said force exerted by said proportioning



valve spring in response to the fluid pressure in said chamber,

said cam means having a cam surface with a straight line portion whereby initial displacement of said cam means will not produce an increase in said force exerted by said proportioning valve spring,

inertia sensitive valve means disposed, in part, in said communication means and constructed to close the communication between said chamber and said inlet in response to a rate of vehicle deceleration that exceeds a predetermined minimum rate,

pressure limiting means disposed in said communication means and constructed to limit the communication between said inlet and said chamber in response to a rate of increase in pressure in said inlet that exceeds a predetermined minimum rate thereby providing means to compensate for vehicle lag.

3,938,851

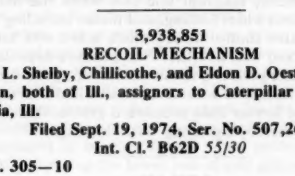
RECOIL MECHANISM

Robert L. Shelby, Chillicothe, and Eldon D. Oestmann, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 19, 1974, Ser. No. 507,264

Int. Cl.² B62D *55/30*

U.S. Cl. 305—10 **9 Claims**



1. In combination with first and second members generally reciprocable so as to be movable in one and the other directions relative to each other, recoil means comprising:

cylinder means associated with the first member and movable therewith upon relative movement between said members in one and the other directions, said cylinder means having an open end;

a sleeve piston disposed within said cylinder means and movable therein;

a rod member disposed within the sleeve piston, and extending inwardly of said cylinder means through said open end of said cylinder means, said cylinder means, rod member and sleeve piston forming a substantially closed chamber in which substantially incompressible fluid may be disposed;

reaction means associated with the second member for movement therewith;

said rod member being movable with said second member inwardly of the cylinder means upon relative movement between said members in the one direction;

compressible and extensible resilient means associated with the sleeve piston and reaction means to urge them apart,

whereby, with said chamber substantially filled with substantially incompressible fluid, movement of the rod member with the second member inwardly of the cylinder means, upon relative movement between said members in said one direction, moves the sleeve piston relative to the cylinder means directionally opposite the movement of the rod member relative to the cylinder means, whereby, upon said relative movement of said first and second members in said one direction, the amount of compressing movement of the resilient means is greater than the corresponding amount of relative movement of the first and second members in said one direction.

3,938,852

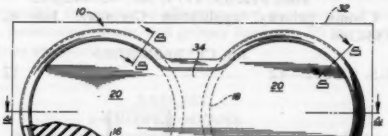
ELASTOMERIC STRUCTURAL BEARING

Richard D. Hein, Wabash, Ind.; John A. Welch, Cuyahoga Falls, and James E. Britton, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 394,692, Sept. 6, 1973. This application Dec. 19, 1974, Ser. No. 534,269

Int. Cl.² F16C *25/02*

U.S. Cl. 308—3 R **7 Claims**



1. An internally reinforced elastomeric bearing structure adapted to support a tilting and laterally movable load without external support or confinement within an enclosure, comprising:

a. a substantially flat monolithic elastomeric support body defining an upper surface disposed in parallel spaced apart relation with a lower surface and a peripheral edge bounding the perimeters of said surfaces;

b. a plurality of inextensible tension support rings embedded in said peripheral edge and around the periphery of said support body with each support ring being selectively disposed both in laterally spaced apart relation and in vertically spaced apart relation to the next adjacent support ring, and said support rings extending serially from close to the top surface to the close to bottom surface of said support body.

3,938,853

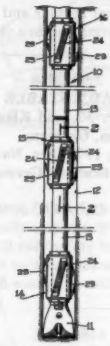
SHRINK-FIT SLEEVE APPARATUS FOR DRILL STRINGS

Rainer Jürgens, Westercelle, and Alfred Ostertag, Celle, both of Germany, assignors to Christensen Diamond Products Company, Salt Lake City, Utah

Continuation-in-part of Ser. No. 465,818, May 1, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 532,745

Int. Cl.² F16C *1/26*

U.S. Cl. 308—4 A 39 Claims



1. Apparatus adapted to be disposed in a bore hole, comprising a drill string member having a cylindrical exterior surface, an inner sleeve on said member and having an internal cylindrical surface conforming to the cylindrical surface of said member, said sleeve also having an external conical surface, an outer sleeve surrounding said inner sleeve and having an internal conical surface conforming to said external conical surface and in contact therewith, spaced seal means between the exterior of said inner sleeve and interior of said outer sleeve providing a confined region for tapping fluid under pressure between said sleeves, and means for conducting fluid under pressure to said confined region to expand said outer sleeve and enable said outer sleeve to be moved relatively longitudinally along said inner sleeve outer surface to shrink-fit said outer sleeve on said inner sleeve and said inner sleeve on said drill string member upon relieving of the fluid pressure.

3,938,854

TRACK SHAFT — BED OF BALL BEARING

Hiroshi Teramachi, 8-34-2, Higashi-tamagawa, Setagaya, Tokyo, Japan

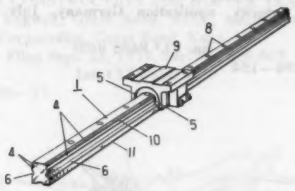
Filed Oct. 7, 1974, Ser. No. 512,456

Claims priority, application Japan, Oct. 19, 1973, 48-120712

Int. Cl.² F16C *29/04*

U.S. Cl. 308—6 R 1 Claim

1. A machine slide comprising an elongated bar having two opposite sides with respective upper portions having respective arcuate surfaces with a plurality of circumferentially spaced apart cylindrical recesses each of said recesses having ball bearings therein, and a saddle member having a circularly cylindrical recess and with a bottom having a lower opening into which the bar extends, said saddle member being engaged on said ball bearings for movement thereon, said sides of said bar having a respective stop recess below the respective arcuate surface into which the respective bottom edges bounding the saddle member cylindrical recess extends.



3,938,855

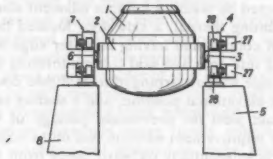
LARGE CONVERTER ARRANGEMENT

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 7, 1975, Ser. No. 539,175

Int. Cl.² F16C *29/00*

U.S. Cl. 308—6 R 11 Claims



1. A drive and bearing arrangement for a large converter construction with an expansion bearing assembly on one side, a fixed bearing assembly opposite the expansion bearing assembly and driving means for both the expansion bearing assembly and the fixed bearing assembly, characterized in that the expansion bearing assembly comprises

a first bushing with recesses of semi-circular cross-section therein,

an axially movable first trunnion supported in said first bushing and having recesses of semi-circular cross-section therein, the recesses in said first bushing and the recesses in said first trunnion complementing one another so as to form spaces of circular profile,

a first driving toothed wheel in connection with said axially movable first trunnion, and

torque-transmitting crowned rollers located within said spaces of circular profile; and further characterized in that the fixed bearing assembly comprises

a second bushing,

a second trunnion, part of which protrudes into and is force-locked to said second bushing,

a second driving toothed wheel in connection with said second trunnion, and

a bearing, containing inner rings and outer rings, provided between the bushing and the trunnion, said rings having spherical faces acting as mutual running faces, which running faces have a common center.

3,938,856

WATER COLLECTING DEVICE ASSOCIATED WITH THE SIDE WINDOW OF A VEHICLE

Lutz Janssen, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed July 12, 1974, Ser. No. 488,009

Claims priority, application Germany, July 14, 1973, 2335957

Int. Cl.² B60J 9/00

U.S. Cl. 296—154 2 Claims

1. In a vehicle comprising a front windshield capable of being contacted by water, a column adjacent said windshield for the mounting thereof, a side door located laterally rearward of said column and having an outer edge adjacent said column, said side door and said column forming a joint therebetween, a side window arranged in said side door and occupying a first elevational position, and a sealing member positioned in said joint for preventing passage of water therethrough; the improvement wherein said outer edge of said side door projects substantially outward, away from said column, by a predetermined distance from the outermost periphery of said column, wherein said outer edge of said side door, and said column and said sealing member are dimensioned so as to form an impervious channel, having an opening extending across the direction of flow of water which would normally flow rearwardly and laterally from the windshield onto the side window of the door, for intercepting water when water is flowing from said windshield rearwardly and laterally towards said side window, for transferring intercepted water downward away from said side window, and wherein said channel has a lower end occupying a second elevational position lower than said first elevational position of said side window, said lower end terminating at an outlet for discharging water remotely from said side window.

3,938,857

ROCKER SPRING UNIT

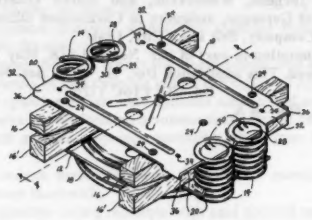
Charles H. Craig, Fort Smith, Ark., assignor to Hickory Springs Manufacturing Company, Hickory, N.C.

Filed Apr. 23, 1973, Ser. No. 353,502

Int. Cl. A47c 3/02

U.S. Cl. 297—263 8 Claims

1. A rocker spring unit comprising top and bottom generally flat plate members, rocker springs attached to and extending between opposite edge portions of said plate members, and separate rocker elements attached to said plate members in paired relation inboard of said rocker springs at the respective inner faces of said top and bottom plate members and in symmetrical relation to the attachment of said rocker springs at said opposite edge portions of said plate members, said top plate member extending to provide a land at each corner



thereof beyond said rocker springs and said rocker elements for securing the rocker spring unit to a chair bottom thereat.

3,938,858

CHAIR WITH ADJUSTABLE BACKREST

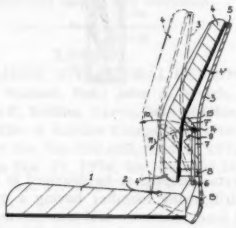
Fritz Drabert, Marienstr. 37, and Klaus Geffers, Goethestr. 26, both of 495 Minden, Germany

Filed Dec. 2, 1974, Ser. No. 528,614

Claims priority, application Germany, Dec. 3, 1973, 2360165

Int. Cl.² A47C 3/00

U.S. Cl. 297—284 12 Claims



1. A chair of the type having a seat and a pivotable backrest wherein said backrest includes:

a backplate pivotally supported to a frame,

a backrest member forwardly of said backplate and secured adjacent its upper portion to said backplate,

and means responsive to the pivotal movement of said backplate about its pivotal support for moving at least that portion of said backrest member which is disposed adjacent the sacro-lumbar region of a seat occupant by an amount in excess of that resulting from said pivotal movement alone, said responsive means moving said portion of said backrest member forwardly as the backrest is forwardly pivoted and moving said portion of said backrest member rearwardly as the backrest is rearwardly pivoted.

3,938,859

CHILD SAFETY SEAT FOR VEHICLES WITH HARNESS RELEASE INACCESSIBLE TO CHILD PASSENGER

Cyril Henderson, Woodland Hills, and John N. Broughton, Northridge, both of Calif., assignors to American Safety Equipment Corporation, Encino, Calif.

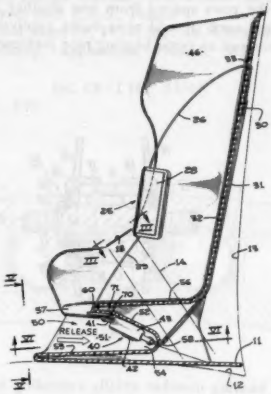
Filed May 20, 1974, Ser. No. 471,465

Int. Cl.² A62B 35/00

U.S. Cl. 297—385 8 Claims

1. In a child safety seat having a child seating surface and a supporting base structure securable to a vehicle seat by a pre-existing vehicle seat belt and wherein the child seat is provided with its own child seat safety harness having releasable buckling parts to facilitate the child's entry and egress of the child seat when the latter is secured by said pre-existing

vehicle seat belt to the vehicle seat, the improvement comprising the provision of:



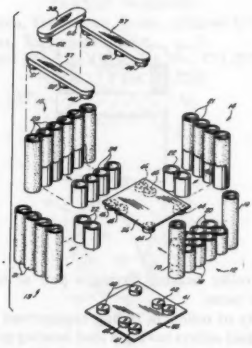
buckle receptacle means in said child seat base structure positioned generally under said child seating surface for receiving the child seat safety harness buckling parts and maintaining them in a substantially inaccessible location relative to a child seated in said child safety seat.

3,938,860

FURNITURE FORMED OF TUBULAR ELEMENTS

Bruce Cobb, 36 E. 7th St., New York, N.Y. 10003

Filed Nov. 15, 1974, Ser. No. 524,103
Int. Cl.² A47C *7/00*
U.S. Cl. 297—440 **9 Claims**



1. An article of furniture, comprising:

a. a plurality of rigid tubes arranged vertically in side-by-side relation, some of said tubes being relatively short and some being relatively long,

b. fastening means connecting said tubes together into a unitary assembly in which all of said tubes are arranged vertically,

c. a seat defined by horizontal load-supporting means resting upon the upper ends of at least some of said short tubes, and

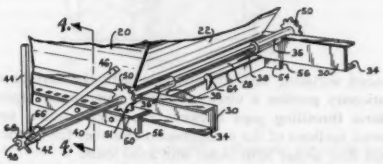
d. a back defined by a row of said relatively long tubes, said long tubes being arranged side-by-side with, and fastened to, some of said short tubes.

3,938,861

DOOR CONSTRUCTION FOR HOPPER TRAILER

James H. Bagwell, Great Bend, Kans., assignor to Doonan Trailer Corporation, Great Bend, Kans.

Filed Sept. 25, 1974, Ser. No. 509,069
Int. Cl.² B61D *7/20*
U.S. Cl. 298—27 **4 Claims**



1. In combination with a land vehicle, hopper construction comprising:

a hopper bed having an opening in its bottom for the discharge of material;

first and second track components of L-shaped cross-sectional configuration extending longitudinally on opposite sides of said opening with one leg of each component extending away from the opening;

closure structure for said opening having a transverse dimension greater than the width of the opening so as to extend beneath said track components;

first and second mounting members of inverted L-shaped cross-sectional configuration disposed in opposed relationship to said track components and extending longitudinally along opposite sides of said closure structure with one leg of each member substantially overlying said one leg of a corresponding track component,

said mounting members being rigidly coupled with said closure structure and adapted to move relative to said track components;

generally planar flange structure having a portion substantially overlying said one leg of at least one of said mounting members and another portion projecting from the said one leg of said one mounting portion;

said flange structure extending substantially along the length of said one member, being rigidly coupled therewith and having a plurality of longitudinally aligned through openings in said other portion; and

a spur gear mounted for rotation with its teeth complementally received by the openings in said flange portion whereby rotation of said gear moves said closure structure.

3,938,862

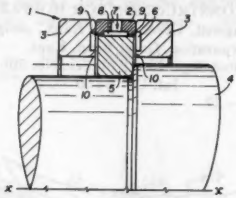
FLUID BEARING SYSTEM

Rainer Schurger, Arnstein; Lothar Walter, Schweinfurt, and Erich Burkl, Stammheim, all of Germany, assignors to SKF Industrial Trading & Development Company, B.V., Amsterdam, Netherlands

Filed Dec. 26, 1973, Ser. No. 427,554
Claims priority, application Germany, Dec. 27, 1972, 2263555
Int. Cl.² F16C *39/04*
U.S. Cl. 308—9 **12 Claims**

1. A fluid bearing for a rotary shaft comprising a housing surrounding said shaft and forming at least one annular compression chamber on the interior surface thereof, at least one portion of said housing being annular and fixed stationary with respect to said shaft and having conduit means for the inlet of

fluid under pressure to said chamber, a ring secured to said shaft for rotation therewith and extending within said compression chamber in spaced opposition to said stationary portion, having a peripheral surface coacting with said annular portion to divide said compression chamber into laterally



spaced sections, said ring forming with the surface of said stationary portion a circumferential compression space and lateral throttling gaps between the inlet conduit and said lateral sections of the compression chamber for restriction of fluid flow under both radial and axial loads.

3,938,863

AEROSTATIC BEARING

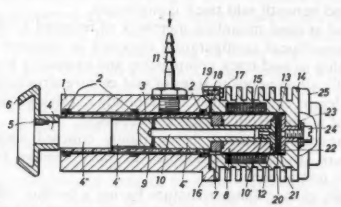
Hans R. Victor, and Jurgen Schmidt, both of Karlsruhe, Germany, assignors to SKF Kugellagerfabriken, Schweinfurt, Germany

Filed Sept. 27, 1974, Ser. No. 509,749

Claims priority, application Germany, Sept. 29, 1973, 2349072

Int. Cl.² F16C *17/16, 13/02*

U.S. Cl. 308—9 **19 Claims**



1. An aerostatic bearing for the spinning turbine of an open end spinning machine comprising a rotatable shaft secured at one end to said turbine, a cylindrically hollow housing surrounding said shaft, means for introducing a gaseous medium under pressure through said housing to form a radial aerostatic bearing about said shaft, said shaft having at least one radial duct and an axial bore communicating with said duct for exhaust of said gaseous medium, said bore being closed to said one end of said shaft and extending through said shaft to open at the other end, an abutment surface fixed with respect to said housing spaced from the other end of said shaft opposite to the opening of said bore to receive the gaseoue media exhausting therefrom and to produce an axial aerostatic bearing with the end of said shaft.

3,938,864

JOURNAL ROLLING BEARING

Berthold Haussels, Wermelskirchen, Germany, assignor to Acousa Saxon S.A., Saxon, Switzerland

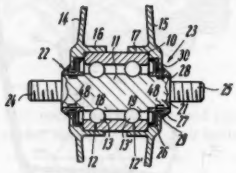
Filed Nov. 26, 1973, Ser. No. 418,999

Claims priority, application Germany, Nov. 30, 1972, 2258577; Oct. 5, 1973, 2344661

Int. Cl.² F16C *1/24*

U.S. Cl. 308—187.2 **18 Claims**

1. A journal bearing comprising an inner bearing member defining a pair of axially spaced inner bearing races, a tubular outer bearing ring encircling said inner bearing member and arranged to provide central support for a wheel or the like, said outer bearing ring being formed with outer bearing races juxtaposed with said inner bearing races, at least two rows of rolling elements between said bearing member and bearing ring with the rows spaced from one another axially of the bearing ring, each of said rows being received in an inner bearing race and an outer bearing race juxtaposed therewith,



the inner bearing member axially extending beyond the respective inner bearing races in opposite directions respective annular seals mounted upon each end of said inner bearing member and engaging said ring for protecting the rolling elements against contamination, and respective threaded elements carried on axial end portions of the inner bearing member for retaining said seals thereon.

3,938,865

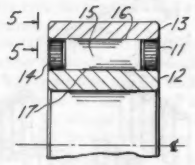
CAGELESS ROLLER BEARING

William S. Rouverol, 22 Lovell Ave., Mill Valley, Calif. 94941

Filed Apr. 1, 1974, Ser. No. 457,052

Int. Cl.² F16C *35/06*

U.S. Cl. 308—205 **30 Claims**



1. In a roller bearing having a pair of circumferentially continuous races,

a plurality of rollers in rolling engagement with said races,

each of said rollers having a load bearing portion formed to a surface of revolution and a pair of spaced apart toothed portions,

each of said races having a load bearing portion formed to a surface of revolution and a toothed portion, one of said races having two spaced apart toothed portions in meshing engagement with the toothed portions on said rollers,

each of said surfaces of revolution having substantially straight generating elements,

the pitch surface of each of said toothed portions containing straight-line extensions of said straight generating elements, the teeth of one of said toothed portions being formed to profiles contacting their mating tooth profiles substantially at the pitch line.

3,938,866

ROLLER CAGES FORMED FROM APERTURED SEPARATORS FOR ROLLER BEARINGS

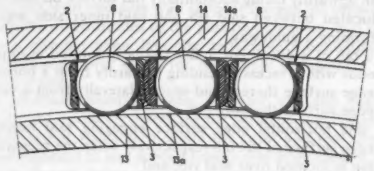
Jacques Lucien Joseph Martin, Paris, France, assignor to Societe Anonyme dite: R.K.S., France

Filed Mar. 13, 1974, Ser. No. 450,690

Claims priority, application France, Mar. 27, 1973, 73.11002

Int. Cl.² F16C 33/46

U.S. Cl. 308—235 12 Claims



1. A roller cage for a roller bearing assembly comprising first and second apertured separators alternately interlocked in one another and each having a housing provided with two apertures, a roller adapted to be received in the housing through one of the apertures and resiliently encased therein, each housing being symmetrical about the axis of revolution of the roller and having its symmetrical center at the mid height of the axis of symmetry, the said first and second separators each having two part spherical surfaces symmetrical about a plane of symmetry containing the axis of the housing and the axis of the cage, the part spherical surfaces on the first separators being convex and those of the second separators being concave and the radius of curvature of the convex surfaces being equal to the curvature of the concave surfaces.

3,938,867

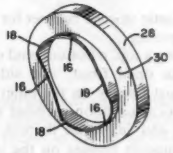
THRUST WASHER

Dean E. Johnston, Thomaston, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed May 20, 1974, Ser. No. 471,282

Int. Cl.² F16C 33/58

U.S. Cl. 308—235 4 Claims



1. A thrust washer comprising: a radially extending annular portion and a flange extending axially from the inner periphery of the radially extending annular portion, said annular portion and flange being made of flat strip steel, said flange having circumferentially spaced cutouts extending around the circumference of the flange; the circumferential lengths of the cutouts at the free end of the flange forming the major part of the total circumference of the flange at such free end with at least a portion of each cutout having a curved surface, the axial lengths of the cutouts being less than the full length of the flange to provide rigidity and strength.

3,938,868

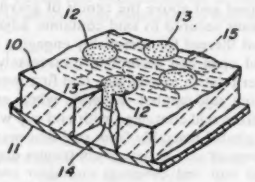
BEARING LUBRICATION SYSTEM

Jan W. VanWyk, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 23, 1974, Ser. No. 508,072

Int. Cl.² F16C 33/10

U.S. Cl. 308—239 10 Claims



1. A bearing structure including relatively movable members having engaging bearing surfaces, one of said members having a plurality of lubricant reservoirs therein opening to the bearing surface, a solid lubricant material contained in each of said reservoirs, said solid lubricant having a coefficient of thermal expansion greater than the material of said one bearing member, and expansion members in said reservoirs under the lubricant, said expansion members having a higher coefficient of thermal expansion than the bearing material.

3,938,869

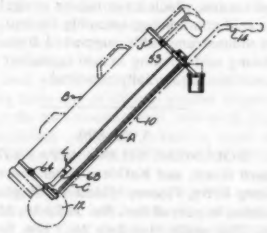
GOLF BAG SUPPORTED BEVERAGE CAN HOLDING ASSEMBLY

Robert M. Josey, 814 E. Grand, Apartment 3, El Segundo, Calif. 90245

Filed Nov. 14, 1974, Ser. No. 523,808

Int. Cl.² A47B 81/00

U.S. Cl. 312—100 5 Claims



1. In combination with a cart supported golf bag, which bag is of the type that has a lug supported from the lower portion thereof in which a longitudinal opening is defined to receive the tip of an umbrella and an open end through which golf clubs project, a multiple beverage can holding container assembly that may be removably secured to said bag, said can holding assembly including:

a. an elongate container defined by a cylindrical side wall that has a first open end and a second end closed by a bottom, said container being of sufficient length that a plurality of beverage cans may be arranged end to end as a stack therein, with a longitudinal opening in said side wall adjacent said bottom through which the lowermost one of said beverage cans may be withdrawn when desired; said stack moving downwardly by gravity to dispose another of said beverage cans in alignment with said opening when one of said beverage cans is withdrawn through the latter, and said beverage cans when emptied

being insertable in said container through said first open end to rest on said stack;

b. an elongate cup having an open end, a cylindrical sidewall, and a bottom, said sidewall adjacent said open end of said cup being capable of snugly and slidably engaging said sidewall of said container adjacent said first end thereof to be removably supported from said container and close the latter;

c. a gimbal assembly secured to said cup adjacent said open end thereof and above the center of gravity of said cup;

d. first means secured to said container adjacent said first open end thereof for removably engaging said bag adjacent said open end thereof to transversely position said container relative to said bag, said first means removably supporting said gimbal assembly when said cup is removed from said container, with said cup when supported by said gimbal assembly from said first means capable of having one of said beverage containers disposed therein, and said cup and beverage container remaining in an upright position at all times when said bag is in either vertical or tilted in a direction in which said gimbal assembly is free to pivot, said first means including:

1. a first circumferentially extending band secured to said container adjacent said first open end thereof;
2. a plurality of circumferentially spaced first lugs secured to said first band, with one of said lugs having said cavity and transverse slot therein; and
3. a plate secured to one of said first lugs, said plate being insertable in the open end of said golf bag to laterally position said container to the latter;

e. second means secured to said container for removably engaging said opening in said bag to transversely position the lower portion of said container adjacent said bottom relative to said bag; said second means including:

1. a second circumferentially extending band secured to said container adjacent said bottom thereof;
2. at least one second lug that extends outwardly from said second band; and
3. a third pin secured to said second lug that removably engages said opening in said lug secured to said golf bag;

f. strap means operatively associated with said first and second means, which strap means encircle said bag and secure said can holding assembly thereto, and

g. cover means removably supported from said container for closing said opening in said container through which said cans are sequentially removed.

3,938,870

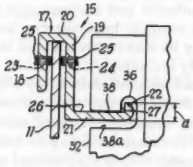
DOCUMENT FILING APPARATUS

Jack Bernard Guest, and Kathleen Ethel Joyce Guest, both of 119 Albury Drive, Pinner, Middlesex, England

Continuation-in-part of Ser. No. 365,635, May 31, 1973, abandoned. This application July 26, 1974, Ser. No. 492,060

Int. Cl.² A47B *63/00*; A44B *21/00*

U.S. Cl. 312—184 **3 Claims**



1. Document filing device for a filing cabinet having a drawer provided with laterally spaced vertical side wall panels comprising in combination,

a. a rail for the horizontal edge of each vertical side wall panels,

b. each rail comprising a channel shaped portion having a depending inner and an outer side wall joined by a web connecting the upper edges thereof and adapted to embrace said panel edge, whereby the rail is readily mountable on the panel edge,

c. a flange projecting inwardly from said inner side wall at right angles thereto,

d. an upwardly projecting rib extending lengthwise of said flange and spaced from said inner side wall,

e. said rib terminating substantially short of the plane of said web,

f. an upwardly facing substantially flat surface on said flange located between said rib and said inner side wall and forming a guideway,

g. a tab of a document folder similarly formed at opposite ends with a recess extending upwardly from a horizontal edge surface thereof and spaced laterally from a vertical edge surface thereof,

h. said horizontal edge surface engaging said horizontal edge surface of the tab respectively when the recess in the tab is located over said rib, and

i. adjustment means on the channel shpaed portion of the rail to engage opposite sides of said panel enabling the spacing of the rib from the panel to be infinitely adjusted and thereafter secured in position.

3,938,871

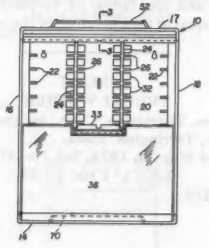
CASSETTE STORAGE DEVICE WITH ADJUSTABLE PARTITIONS

Allan E. Bartholomew, North Canton, Ohio, assignor to Myers Industries, Inc., Akron, Ohio

Filed Jan. 22, 1974, Ser. No. 435,478

Int. Cl.² A47B *57/00*; A47F *3/06*; B65D *21/08*, *85/672*

U.S. Cl. 312—240 **4 Claims**



1. A molded plastic storage cabinet for receiving articles of varied sizes comprising

a frame including a top, a bottom, and opposed sides, which frame has an open front, said sides having vertically spaced support flanges on the inner walls thereof, a removable vertical partition member extending the height of the frame and depthwise thereof, said partition member having support flanges on the sides thereof aligned with said side wall support flanges for support of articles on both sides of the partition member, said partition member being laterally deflectible intermediate its upper and lower edges for removable engagement with said frame,

said top including an integral elevated elongated handle section defined by hand receiving openings formed in said top on opposed sides of such handle section,

two cover members individually slidably engaging the frame adjacent either the top or the bottom thereof for operatively enclosing the front of said frame, each cover member having an arcuately shaped rear edge, a pair of transversely extending cylindrically shaped ribs on the front portion of the cabinet, one for each cover member, to

engage said arcuately shaped rear edge of a said cover member for controlled pivotal movement, and means on a front portion of said partition member to engage edges of said cover members to aid in retaining them in closed position.

3. A molded plastic storage cabinet for receiving articles of either of two selected sizes comprising

a frame including a top, a bottom, and opposed sides, which frame has an open front, said sides having vertically spaced support flanges on the inner walls thereof, a removable flexible vertical partition member extending the height of the frame and depthwise thereof, said partition member having support flanges on the sides thereof aligned with said side wall support flanges for support of articles on both sides of the partition member, said partition member being laterally deflectible intermediate its upper and lower edges for removable engagement with said frame,

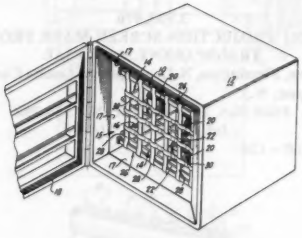
said partition member having a center wall and laterally directed, vertically extending flat surfaced stop flanges on said center wall intermediate the front and rear thereof but adjacent to and spaced from a rear edge thereof, said stop flanges being positioned intermediate and spaced vertically from each vertically adjacent pair of support flanges to permit lateral deflection of said partition member, said stop flanges extending into a storage area formed between each vertically adjacent pair of said support flanges to contact and stop articles being moved into such storage area, the said storage areas being adapted to receive one size of article when abutted against said stop flanges and to receive the other and larger size articles when said stop flanges are removed.

3,938,872

SHELF RETAINER FOR MOBILE VEHICLE REFRIGERATORS

Lynn W. Hagerman, 7236 Burton St., Dublin, Calif. 94566

Filed Oct. 15, 1974, Ser. No. 514,765
Int. Cl.² A47B *96/04*
U.S. Cl. 312—291 **2 Claims**



1. In a mobile refrigerator having, in combination, a refrigeration compartment defined by inside walls, an open front, and a door affording access to the refrigeration compartment through the open front, the compartment having at least one shelf for supporting removable articles thereon, the improvement comprising: an article retaining device including:

a. first elongated adjustable cross-member mounted between the sidewalls;

b. second elongated adjustable cross-member mounted between the sidewalls, and below and parallel to said first cross-member; each of said cross-members comprising a sleeve member and a slide member with an end telescopically inserted in said sleeve member;

c. means for horizontally mounting said crossmembers between the sidewalls comprising an anchor bracket slidably connected to said sleeve member; locking means for selectively fixing said anchor bracket to said sleeve member; a compression spring having a first end contacting said anchor bracket and a second end contacting the end of said slide member said compression spring being compressible between said anchor bracket and the end of said slide member, said cross-members having opposite ends which are forced against said opposing sidewalls when said compression spring is compressed, and;

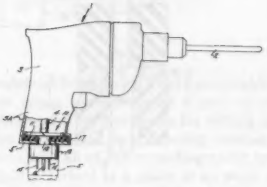
d. a web comprising a plurality of elastic vertical bands and a plurality of horizontal bands, said plurality of vertical bands each having first ends connected to said first cross-member and second ends connected to said second cross-member.

3,938,873

ELECTRICAL PLUG MOUNTING DEVICE FOR POWER TOOLS

James F. Kimball, Star Rte. 2, Box 466, Dexter, Oreg. 97431

Filed Oct. 3, 1974, Ser. No. 511,634
Int. Cl.² H01R *11/02*
U.S. Cl. 339—58 **3 Claims**



1. A device for incorporation into the separable housing of a hand held power tool for mounting an electrical plug member component in exterior abutment with the housing, said device including,

a base of non-metallic material disposed within the tool housing, said base of a shape substantially corresponding to an interior cross section of the housing,

a plug body exterior of the tool housing and having contact blades projecting outwardly therefrom, a wall surface of said plug body for abutment with an exterior wall surface of the tool housing,

a cylindrical neck portion extending intermediate said base and the plug body and of slightly greater length than the thickness of the tool housing wall, said neck portion of a diameter enabling reception within a cord receiving opening formed within said wall surface of the tool housing, and

filler means disposed and fully occupying that area intermediate said base and the interior of said wall surface of the tool housing, said filler means contributing towards securement of the base in place within the tool housing thereby rigidly mounting the exteriorly located plug body against both axial and rotational loads.

3,938,874

ELECTRICAL CONNECTOR CONTACT RETENTION SYSTEM

Normand C. Bourdon, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 433,965, Jan. 16, 1974, abandoned. This application Apr. 17, 1975, Ser. No. 569,028
Int. Cl.² H01R *13/42*
U.S. Cl. 339—59 M **6 Claims**

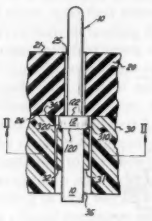
1. An electrical connector unit comprising:

a first insulator having a plurality of bores therethrough extending from a forward face to a rearward face, each of said bores having a central axis; and

a second insulator having a front face mounted against the rearward face of the first insulator, said second insulator

having a plurality of passages therethrough, each axially aligned with the central axis of a respective bore in said first insulator, each of said bores and passages adapted to receive an electrical contact, which is insertable from the rear of said second insulator, each of said contacts having an enlarged section defining a rearwardly facing shoulder and a forwardly facing shoulder, said second insulator further including:

a plurality of rectangularly shaped contact retention members disposed in each of said passages, said members having a front end, a rear end, and an adjacent side between front and rear ends which is integral with said second insulator so that said retention members extend from the walls of said second insulator passages, each of said rear ends tapering inwardly from the wall of said passage towards said central axis in the direction of said first insulator, each of said forward ends including a forwardly facing surface which faces in the direction of said first insulator, said forwardly facing surface being



generally parallel to the front face of said second insulator and integral with said passage wall at the end furthest from the axis of said passage, each of said forwardly facing surfaces being equally distant from said second insulator front face, each of said retention members being resiliently expandable away from said central axis to permit said enlarged contact section to pass into said passage and past said retention members upon forward insertion of the contact into said passage and respective bore from the rear of said second insulator, said retention members contracting behind the rearwardly facing shoulder on the contact upon insertion so that the forwardly facing surfaces of said retention members engage the rearwardly facing shoulder of the contact to limit rearward movement of the contact in said passage, said contact retention members being substantially rigid in the axial direction when in their contracted position behind the enlarged portion of the contact so as to provide a positive stop against rearward movement of the respective contact.

3,938,875

SIGHT FOR USE ON HAND FIREARMS AND A METHOD OF USING IT

Nils Inge Algot Ruder, Erik Dahlbergsgatan 11, 211 48, Malmo, Sweden

Continuation-in-part of Ser. No. 830,566, May 9, 1969, abandoned, and a continuation-in-part of Ser. No. 789,627, Oct. 18, 1968, abandoned, and a continuation of Ser. No. 495,094, Oct. 12, 1965, abandoned. This application Oct. 13, 1969, Ser. No. 868,282

Int. Cl.[2] G02B 27/32

U.S. Cl. 350—10 **21 Claims**

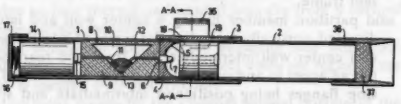
1. A sighting device for a firearm including in combination:

a housing;

means for mounting said housing on a firearm comprising an outer tube adapted to receive said housing, said tube being closed at its forward end and open at its rearward end, bearing means within said tube for engaging and pivotally supporting one end of said housing, and adjustable supporting means within said tube for supporting said housing and for adjusting the angular position of said housing within said tube, said housing extending axially into said outer tube and forming at said rearward end of said tube an opening to be looked into by a shooter when aiming the firearm;

a light unit mounted on the forward end of said housing and comprising a light-collecting member of a luminous, light-diffusing and light-transmitting material, said light-collecting member having a substantial surface area exposed to ambient light, and being constructed to emit light of a first color from a rearwardly-facing surface when exposed to said ambient light;

said light unit further comprising light source means adapted to emit light of a second color from said rearwardly-facing surface, whereby said emitted light varies



from said first color to said second color as the intensity of said ambient light varies;

aperture means in said housing providing an opening of circular configuration to form of light emitted by said light-collecting member a small luminous spot visible through said opening at the rearward end of said tube;

said adjustable supporting means for adjusting the angular position of said housing within said tube further controlling the position of said aperture means in mutually perpendicular directions in relation to the axis of said outer tube; and

convergent lens means at the rearward end of said housing in the path of the light forming said luminous spot, said convergent lens being adjusted to make a virtual image of said luminous spot at an infinite distance, as viewed through said opening.

3,938,876

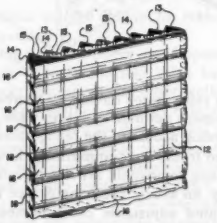
FRONT PROJECTION SCREEN MADE FROM A TRANSPARENT MATERIAL

John Brown, Flemington, N.J., assignor to Qantix Corporation, Flemington, N.J.

Filed Dec. 19, 1974, Ser. No. 534,298

Int. Cl.[2] G03B 21/60

U.S. Cl. 350—128 **2 Claims**



1. A front projection screen made from a sheet of light transmitting material having a predetermined critical angle of internal reflection less than 45%; said sheet having a front surface and a back surface; said screen being characterized by:

said back surface having formed thereon a plurality of parallel ridges; each of said ridges having curved sides terminating at a peak; said curved sides extending away from said sheet at an angle equal to or greater than 45°

immediately adjacent to said sheet; the angle between a line tangent to said sides and said sheet continuously decreasing as said curved sides extend towards said peak; the angle between a line tangent to said sides and said sheet being greater than or equal to said predetermined critical angle of internal reflection at said peaks but less than 45°;

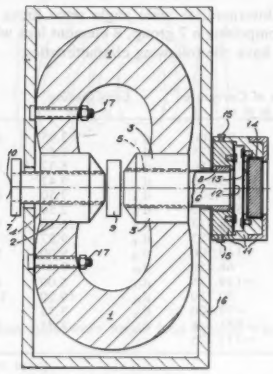
said front surface having formed thereon a plurality of parallel ridges each forming a section of a cylinder; said ridges on said front surface being disposed perpendicularly to said ridges on said back surface; and

said parallel ridges which form sections of cylinders each have therefore a focal length and the distance from said front surface to said back surface is between 30 percent and 70 percent of said focal length.

3,938,877
HYPERFINE FILTER FOR THE RESONANCE LINES OF CAESIUM AND RUBIDIUM

Franco Strumia, and Nicola Beverini, both of Pisa, Italy, assignors to Consiglio Nazionale Della Ricerche, Milan, Italy

Filed Apr. 10, 1974, Ser. No. 459,728
Claims priority, application Italy, Apr. 12, 1973, 49407/73
Int. Cl.² G02B *27/28*
U.S. Cl. 350—148 **8 Claims**



1. A hyperfine filter for the resonance lines of the alkali metals, caesium and rubidium which comprises in series,

a cell transparent to light rays and which contains vapors of the alkali metal to be filtered;

a device for generating a magnetic field into which said cell is placed;

a lamp of the metal of which filtering is desired, the light beam emitted therefrom being directed to strike said cell so that the two hyperfine components of the resonance line passing through the cell are absorbed by the atoms present in the cell as radiation 6^+ or 6^- respectively so that in each hyperfine line only one of the two orthogonal components of circular polarization is absorbed;

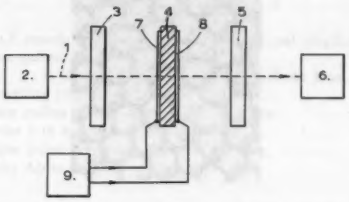
a circular analyzer for separating one of the hyperfine components of the light beam emerging from the said cell from the other and which includes a λ/4-wave plate and a linear polarizer arranged in series; and

an interference filter for selecting the particular resonance line desired.

3,938,878
LIGHT MODULATOR

Alan John Fox, Horley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 261,288, June 9, 1972, abandoned, which is a continuation of Ser. No. 104,077, Jan. 5, 1971, abandoned. This application Sept. 12, 1974, Ser. No. 505,591
Claims priority, application United Kingdom, Jan. 9, 1970, 1173/70
Int. Cl.² G02F *1/03, 1/29*
U.S. Cl. 350—150 **22 Claims**

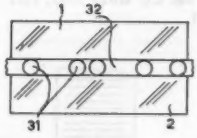


1. A light modulator comprising a light-permeable crystal of the m3m point group provided with a pair of electrically conductive light-permeable electrodes for setting up an electric field within the crystal in a direction making an angle greater than zero with all of the crystallographic axes, means for directing light polarized in a plane at an angle to the fast and slow directions of the crystal through the crystal in a direction making an angle greater than zero with all of the crystallographic axes and which makes an angle smaller than 90° with the field direction, and a polarization analyzer provided in an output path for the light from the crystal.

3,938,879
LIQUID CRYSTAL DEVICES

Claudio Dalmasso, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Continuation of Ser. No. 272,524, July 17, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 527,005
Claims priority, application Italy, Nov. 24, 1971, 70842/71
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **2 Claims**



1. In a device having two parallel members adapted to contain liquid crystal material therebetween and spacer means for spacing said members from each other a given distance and attaching same to each other, wherein the improvement comprises:

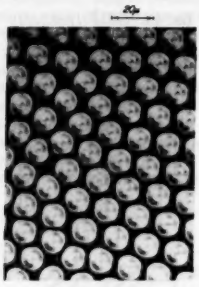
said spacer means comprising alumina particles in a glass matrix and disposed proximate to the edges of said members with the diameter of the particles equal to said given distance and wherein the glass matrix is in a molten state during the assembly of said device and solidifies attaching said members to each other with said members spaced apart said given distance by said particles.

3,938,880

SPHERULITIC LIQUID CRYSTALLINE TEXTURE

Werner E. L. Haas, Webster, and James E. Adams, Bear Creek Harbor East, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,598
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 56 Claims



56. A method of producing a stable spherulitic liquid crystalline texture, comprising:

a. providing on a substrate a layer of aligned liquid crystalline composition comprising a dielectrically negative nematic liquid crystalline material and from about 0.4 to about 3 percent by weight of an optically active material, said liquid crystalline composition prior to alignment being optically negative and having a light reflection band centered about $\lambda_o = 2np$ where n = index of refraction and p = helical pitch, the ratio of the helical pitch of the non-aligned liquid crystalline composition to the layer thickness of liquid crystalline composition being from about 1 to about 10;

b. applying a voltage potential across the layer of liquid crystalline composition; and

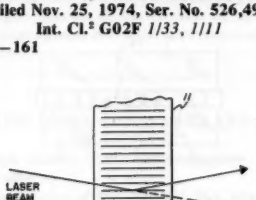
c. removing said voltage potential whereupon spherulitic regions of the liquid crystalline composition are formed within the aligned liquid crystalline composition.

3,938,881

ACOUSTO-OPTIC MODULATION DEVICE

David K. Biegelsen, Woodside; Gary K. Starkweather, Saratoga, and James C. Zesch, Mountainview, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1974, Ser. No. 526,493
Int. Cl.² G02F 1/33, 1/11
U.S. Cl. 350—161 17 Claims



1. An acousto-optical light deflection device comprising:

a plastic sound medium, and

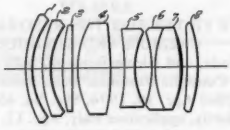
a piezo-electric sound transducer integrally bonded to said medium, said transducer being adapted to receive a modulated signal so as to generate acoustic waves, whereby acoustic waves transmitted to said medium form a diffraction grating for a light beam passing through said medium.

3,938,882

HIGH NUMERICAL APERTURE INTERMEDIATE WIDE ANGLE OBJECTIVE

Michiro Oishi, Tokyo, Japan, assignor to Asahi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 20, 1974, Ser. No. 507,743
Claims priority, application Japan, Sept. 27, 1973, 48-108715
Int. Cl.² G02B 9/64
U.S. Cl. 350—214 3 Claims



1. An intermediate wide angle retro focus objective lens system comprising a 7 group, 8 element lens wherein the lens elements have the following characteristics:

	Radius of Curvature in m m		Lens spacing in m m	n_i / ν_i
r_1	92.500	d_1	3.95	1.51633 / 64.1
r_2	57.275	d_2	9.52	
r_3	132.250	d_3	5.32	1.69350 / 53.3
r_4	55.875	d_4	9.42	
r_5	167.500	d_5	7.50	1.83400 / 37.2
r_6	1537.500	d_6	2.50	
r_7	68.313	d_7	26.50	1.78590 / 44.2
r_8	−178.523	d_8	9.27	
r_9	−149.500	d_9	9.00	1.76182 / 26.6
r_{10}	68.250	d_{10}	9.67	
r_{11}	−159.375	d_{11}	5.00	1.74077 / 27.8
r_{12}	80.750	d_{12}	19.20	1.806610 / 40.8
r_{13}	−79.500	d_{13}	3.75	
r_{14}	−951.448	d_{14}	8.75	1.78590 / 44.2
r_{15}	−111.275			

$F = 100.0$
$|F_{1,2}| = 95.13$
$F_{1,2,3,4} = 83.54.$

Seidel's Coefficients

Lens Surface	S_1	S_2	S_3	S_4	S_5
1	0.284	0.131	0.061	0.368	0.198
2	−2.375	−0.138	−0.008	−0.595	−0.035
3	0.493	0.272	0.151	0.310	0.255
4	−9.272	−0.324	−0.011	−0.733	−0.026
5	2.942	0.879	0.263	0.271	0.160
6	−0.187	−0.225	−0.270	−0.030	−0.360
7	4.454	0.977	0.214	0.637	0.187
8	3.146	−1.869	1.111	0.247	−0.806
9	−2.925	1.608	−0.884	−0.289	0.645
10	−1.069	−0.892	−0.743	−0.634	−1.148
11	0.003	−0.010	0.034	−0.267	0.771
12	0.264	0.175	0.116	0.026	0.094
13	1.593	−0.366	0.084	0.561	−0.148
14	−0.074	0.120	−0.193	−0.046	0.386
15	3.029	−0.261	0.023	0.395	−0.036
SUM	0.306	0.078	−0.054	0.223	0.134

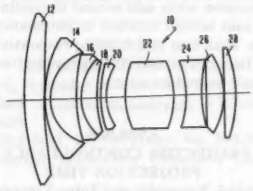
Wherein the lenses are numbered from 1 to 8 from the object side, and lenses 5 and 6 form doublets; and wherein

F: is the resultant focal length of the whole optical system;
$F_{1,2,\ldots,i}$: is the resultant focal length of the first to the i-th lenses;
n_i: is the d-line index of refraction of the i-th lens;
ν_i: is the Abbe's number of the i-th lens;
r_k: is the radius of curvature of the k-th surface; and
d_j: is the j-th lens spacing or lens thickness.

3,938,883
WIDE ANGLE LENS SYSTEM

Yasuo Takahashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1975, Ser. No. 572,866
Claims priority, application Japan, May 8, 1974, 49-50954
Int. Cl.² G02B 9/64, 13/04
U.S. Cl. 350—214 **1 Claim**



1. A retrofocus type wide angle lens system which comprises:
a first positive lens;
a second negative meniscus lens having a face of larger curvature towards the image side and being in light communication with said first lens;
a third negative meniscus lens having a face of larger curvature towards the image side and being in light communication with said second lens;
a fourth positive lens bonded to said face of larger curvature of said third lens and being in light communication with said third lens;
a fifth negative meniscus lens having a face of larger curvature towards the image side and being in light communication with said fourth lens;
a sixth positive lens in light communication with said fifth lens;
a seventh negative lens in light communication with said sixth lens;
an eighth positive meniscus lens having a face of larger curvature towards the image side and being in light communication with said seventh lens;
a ninth positive lens being in light communication with said eighth lens. said lens system satisfying the following conditions:

$$(1)\quad \frac{F}{0.22} < F_1 < \frac{F}{0.12}$$

$$(2)\quad \frac{F}{1.75} < F_{1,2,3,4,5} < \frac{F}{1.35},\ F_{1,2,3,4,5} < 0$$

$$(3)\quad 0.05 < n_5 - n_4 < 0.15,\ 8 < \nu_5 - \nu_4 < 15$$

$$(4)\quad \frac{F}{0.85} < F_{1,2,3,4,5,6} < \frac{F}{0.6}$$

$$(5)\quad 1.5 < \frac{n_6 + n_9}{2} < 1.75,\ 50 < \frac{\nu_6 + \nu_9}{2} < 62$$

wherein F equals 100 and is the composite focal length of the total lens system;
$F_{1,2,\ldots,i}$ is the composite focal length of the lens group consisting of 1st to ith lenses;
r_j is the radius of curvature of jth lens face;
d_k is the k th spacing or lens thickness;
n_i is the d-line refractive index of ith lens;
ν_i is the Abbe number of ith lens;

r_1 =	246.8	d_1 =	19.2	n_1=1.71300	ν_1=54.0
r_2 =	604.7	d_2 =	0.4		
r_3 =	103.5	d_3 =	6.1	n_2=1.62041	ν_2=60.3
r_4 =	43.6	d_4 =	23.1		
r_5 =	183.0	d_5 =	4.1	n_3=1.78590	ν_3=44.2
r_6 =	47.5	d_6 =	15.8	n_4=1.67270	ν_4=32.1
r_7 =	172.8	d_7 =	2.0		
r_8 =	111.4	d_8 =	5.3	n_5=1.64250	ν_5=58.4
r_9 =	53.0	d_9 =	18.5		
r_{10}=	113.5	d_{10}=	43.2	n_6=1.74320	ν_6=49.4
r_{11}=	− 91.2	d_{11}=	10.7		
r_{12}=	− 126.2	d_{12}=	16.0	n_7=1.80518	ν_7=25.4
r_{13}=	171.9	d_{13}=	5.5		
r_{14}=	− 563.0	d_{14}=	14.3	n_8=1.52307	ν_8=58.4
r_{15}=	− 65.3	d_{15}=	0.4		
r_{16}=	34680.0	d_{16}=	10.8	n_9=1.69680	ν_9=55.7
r_{17}=	− 146.9				

$$F_1 = 571.4 = \frac{F}{0.175}$$

$$F_{1,2,3,4,5} = -65.4 = -\frac{F}{1.53}$$

$$F_{1,2,3,4,5,6} = 149.3 = \frac{F}{0.67}$$

3,938,884
LARGE APERTURE PHOTOGRAPHIC LENS SYSTEM

Jihei Nakagawa, Higashi-murayama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1975, Ser. No. 549,479
Claims priority, application Japan, Feb. 14, 1974, 49-17987
Int. Cl.² G02B 9/62
U.S. Cl. 350—215 **4 Claims**

1. A large aperture photographic lens system comprising a first positive meniscus lens, a second positive meniscus lens, a third negative meniscus lens, a fourth cemented doublet lens component consisting of a negative lens and a positive lens, a fifth positive meniscus lens and sixth positive lens, and said large aperture photographic lens system satisfying the following conditions:

(1) $0.9 < r_{11}/r_9 < 1.05$, $|r_9| > 0.55f$
(2) $0.95 < d_9/d_{10} < 1.25$
(3) $1 < r_5/r_4 < 1.3$
(4) $0.03f < d_4 < 0.05f$
(5) $n_1, n_2, n_5, n_6, n_7 > 1.75$

wherein reference symbol f represents the focal length of the entire lens system, reference symbols r_4, r_5, r_9 and r_{11} represent respective radii of curvature of the image side surface of said second lens, the object side surface of said third lens, the

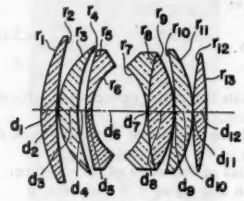


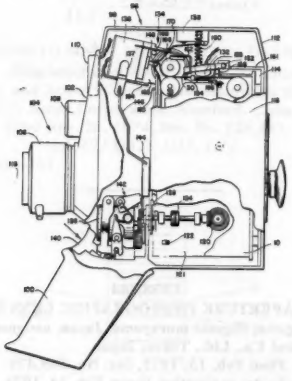
image side surface of said fourth component and the image side surface of said fifth lens, reference symbol d_4 represents the air space between the second lens and the third lens, reference symbols d_9 and d_{10} represent respective thicknesses of the image side lens of said fourth component and the fifth lens and reference symbols n_1, n_2, n_5, n_6 and n_7 represent respective refractive indices of said first lens, said second lens, the image side lens of said fourth component, said fifth lens and said sixth lens.

3,938,885

MULTIPURPOSE AUDIO-VISUAL CASSETTE SYSTEM

Donald T. Scholz, Watertown, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 374,578, June 28, 1973, Pat. No. 3,848,977. This application Aug. 5, 1974, Ser. No. 494,838
Int. Cl.² G03B 23/02
U.S. Cl. 352—78 R **3 Claims**



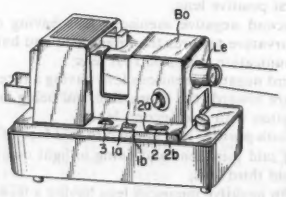
1. A film handling cassette for use with audiophotographic apparatus, the apparatus including first and second drive means for advancing a strip of film having a perforated edge, said first drive means including a capstan arrangement configured for advancing said film strip in accordance with capstan pressure engagement therewith, said second drive means including a shuttle drive configured for advancing said film strip in accordance with shuttle engagement of said perforated edge of said film strip, said cassette comprising a housing, a strip of photographic film material retained within said housing, means for guiding said film strip in a given direction along a given path within said housing, means for defining an opening in said housing for facilitating performance of a photographic program and an audio program with said film strip, said opening defining means including means for receiving the first drive means for engagement with said film strip at a first location along said given path and for receiving the second drive means in engagement with said film strip at a second location along said given path so that said film strip is advanced in said given direction from said first location to said second location, said guiding means including means for defining a minimum length of film path between said first and second locations and for storing an excess of film between said first and second locations in a free film loop extending out of said opening defining means and exteriorly of said housing, and said film strip including a first and second discontinuity located near the trailing end of said film strip with said first discontinuity interposed between said second discontinuity and said trailing end of said film strip, said second discontinuity including an interruption in said perforated edge of said film strip, said interruption being configured for disabling film cooperation with the second drive means so as to preclude advancement of said second discontinuity past said second location, said first discontinuity including means for engaging the first drive means to preclude advancement of said first discontinuity past said first location, and said first and second discontinuity being spaced from each other along said film strip a distance substantially equal to said minimum path length for halting the advancement of said first discontinuity at said first location while said second discontinuity is further advanced to said second location to automatically withdraw said film loop back into said housing responsive to advancement of said first and second film discontinuities respectively to said first and second locations.

3,938,886

SLIDE PROJECTOR CONTROLLABLE OF ITS PROJECTION TIME

Masanori Uchidoi, Kawasaki, and Tateo Yamada, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1973, Ser. No. 412,837
Claims priority, application Japan, Nov. 11, 1972, 47-129976[U]
Int. Cl.² G03B 23/04
U.S. Cl. 353—115 **20 Claims**



1. A slide film projector, comprising in combination:
a. slide film supporting means for supporting a plurality of slides while supporting one of said slides in a ready position;
b. slide film moving means for causing a slide film to move between said ready position and a projection position;
c. means for driving said slide film moving means including a motor arranged for running without interruption in between a plurality of successive operations of said slide film moving means;

d. means for programming movement of said slide film moving means, including:

1. slide film movement control means including a selectively connectable and disconnectable driving connection with said driving means, for causing said slide film moving means to operate sequentially in a predetermined cycle by receiving driving force from said driving means through said driving connection;

2. switching means, operatively connected with said control means, for disconnecting the driving connection of said control means with said driving means when a slide film is positioned at said projection position by said slide film moving means, and for maintaining the driving connection therebetween when no slide film is in said projection position; and

3. timer switch means, operatively connected to both said switching means and said control means, for governing the projection time of said slide film, said timer switch means being provided with selective setting means for setting a particular projection time for said slide film and having time measuring means responsive to said switching means for restoring the driving connection between said control means and said driving means upon lapse of the time set by said setting means, said timer switch means further having means for resetting said time measuring means to a beginning state in response to said switching means when said slide film is caused to shift from said projection position to said ready position by said slide film moving means, and

e. means for shifting said slide film support means, between cycles of said slide film moving means, so as to bring different slides successively into said ready position.

3,938,887

REPRODUCTION CAMERA

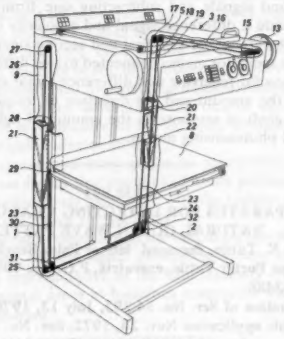
Sven Nygaard, Nykobing Falster, and Rex Stemann Larsen, Rodovre, both of Denmark, assignors to Eskofot A/S, Ballerup, Denmark

Filed Sept. 21, 1973, Ser. No. 399,519

Claims priority, application Denmark, Oct. 16, 1972, 5103/72

Int. Cl.² G03B 27/62

U.S. Cl. 355—63 2 Claims



1. A reproduction camera comprising:

a frame,

a fixed table carried by said frame and having a supporting plate for a light-sensitive sheet,

two vertical guide members on said frame at adjacent corners of said frame,

first and second counterweights,

two pairs of cord pulleys associated with one of said guide members, one of said pair being mounted above and the other of said pair being mounted below said one of said guide members, a third pair of cord pulleys and a single pulley associated with the other of said guide members, said third pair being mounted below the other of said guide members and said single pulley being mounted above said other guide member, and

a winding drum mounted on said frame for rotation,

means attached to said drum member for manual rotation thereof,

an endless cord wound several times on said drum,

a movable table,

said cord extending from said drum to and engaging one of said pulleys mounted above said one guide member, and then vertically downwardly past said one guide member and fixedly attached to said movable table, and then to and engaging one of said pulleys mounted below said one guide member and then horizontally to and engaging one of said pulleys below said other guide member, and then vertically past said other guide member and attached to one of said counterweights, and then vertically to and engaging said single pulley, and then vertically past said other guide member and fixedly attached to said movable table and then to and engaging the other pulley below said other guide member and then horizontally to and engaging the other pulley below said one guide member and then vertically past said one guide member and attached to the other of said counterweights and then to and engaging the other pulley above said one guide member and then to said drum, so that rotation of said drum in one direction raises said counterweights and lowers said movable table and rotation of said drum in the opposite direction lowers said counterweights and raises said movable table.

3,938,888

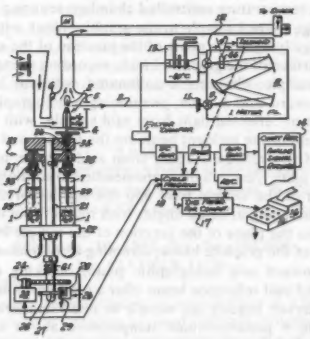
AUTOMATED PRECISION FLAME-EMISSION PHOTOMETRIC APPARATUS

Theodore R. Folsom, La Jolla; Gerald J. Parks, Jr., and William E. Weitz, Jr., both of San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1975, Ser. No. 546,355

Int. Cl.² G01J 3/30

U.S. Cl. 356—87 15 Claims



1. Apparatus for use with a flame-emission spectrometer having an aspirator tube feeding a liquid test sample to a burner flame for producing photoelectrically-detectable spectral line emission beams, said apparatus comprising:

a fixed valve plate having a port sealably receiving said aspirator tube,

a movably-indexable valve plate provided with a plurality of capillary-sized ports disposed for communication with said fixed plate port when said movable plate is indexed,

an elongate hollow-bore aspirating tube mounted in and dependently carried by each of said movable plate ports,

a plurality of liquid sample holders each disposed for immersibly receiving one of said elongate tubes,

drivable support means carrying said indexable valve plate and said sample holders, and

means for driving said support means for successively indexing said movable plate and holders into aligned communication with said fixed plate port whereby each fluid sample can be aspirated into said burner flame,

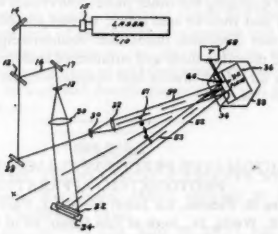
said fixed and movable valve plates having mating flat valveface surfaces constantly maintained in flush contact one with the other for excluding atmospheric leakage into said ports.

3,938,889

METHOD AND APPARATUS FOR MEASURING LINEAR THERMAL EXPANSION OF POLYMERIC MATERIAL

James A. McKinnis, Rice County, Kans., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 4, 1974, Ser. No. 476,178
Int. Cl.² G01B 9/02
U.S. Cl. 356—109 **3 Claims**



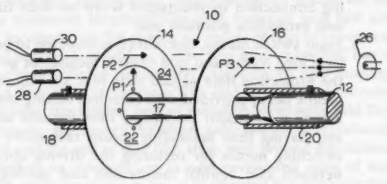
1. The method of measuring the linear thermal expansion of a sample of a polymeric material for determining the coefficient of linear expansion of the material, comprising: preparing a wedge shaped sample of polymeric material having a sharp tip; positioning the wedge shaped sample on a graphite block within a temperature controlled chamber; securing the base of the wedge shaped sample to the graphite block with the tip of the wedge lying in the plane of the junction of the sample base and a surface of the graphite block; recording the temperature of the sample; directing a collimated coherent laser object beam toward said sample; positioning a holographic plate in the path of reflected light from said sample, with the central beam path of the incident beam on the sample and the central beam of the reflected beam from said sample to the holographic plate lying in a plane perpendicular to the plane of the junction of the sample base and the surface of the graphite block and being at equal angles with respect to a line perpendicular to the plane of the junction of the sample base and the surface of the graphite block; directing a collimated reference beam toward said holographic plate; blocking said object beam and said reference beam after a predetermined exposive time interval; heating the sample at small temperature increments to a predetermined temperature above the original measured temperature; allowing the sample to remain at such predetermined temperature for between 30 to 45 minutes; recording the sample temperature after expansion of the sample; exposing said holographic plate a second time to said reference beam and the reflected beam from said sample; blocking the reference beam and the object beam after a predetermined exposure time interval; removing the holographic plate; developing the holographic plate; restoring the holographic plate to its former position; illuminating the holographic plate with only the reference beam to reconstruct the sample images with the fringe pattern thereon which provide an indication of the thermal expansion of the polymeric sample.

3,938,890

TORQUE-TRANSDUCER UTILIZING DIFFERENTIAL OPTICAL SENSING

Evan R. Flavell, P.O. Box 6397, Albany, Calif. 94706

Filed Oct. 15, 1974, Ser. No. 514,997
Int. Cl.² G01J 4/04; G01L 3/04, 3/12
U.S. Cl. 356—119 **16 Claims**



1. A torque transducer for measuring a torque in a shaft, said torque transducer comprising:

a shaft;

light transmission control means attached thereto and responding to torque stress induced therein, having,

a first area of light transmission control and a second area of light transmission control responding in an equal but opposite manner to said torque stress;

light source means mounted on one side of said light transmission control means;

first and second photosensing and signal generating means mounted on the other side of said light transmission control means and oriented in such a manner as to separately and respectively receive light transmitted through each of said first and second areas thereof and to generate first and second signals respectively;

differential circuit means connected to said photosensing and signal generating means and receiving said first and second signals and subtracting one from the other to provide a difference signal and a polarity corresponding to the greater of said first and second signals, and

torque indicator means connected to said differential circuit means for receiving said difference signal and for indicating the amount and the direction of torques exerted on the shaft in response to the amount of light received by said photosensing means.

3,938,891

APPARATUS FOR DETECTING CHANGES IN A NATURAL OCEAN WAVE PATTERN

Fordyce E. Tuttle, deceased, late of Palm Beach, Fla., and by Eleanor Porter Tuttle, executrix, P.O. Box 908, Palm Beach, Fla. 33480

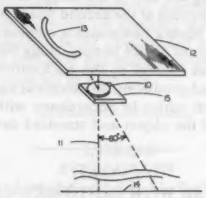
Continuation of Ser. No. 54,293, July 13, 1970, abandoned. This application Nov. 24, 1972, Ser. No. 310,187
Int. Cl.² G01B 11/30; G01N 21/40
U.S. Cl. 356—120 **1 Claim**

1. A device for detecting the presence of a moving underwater vehicle which discerns differences in the natural occurring ocean surface wave pattern comprising:

an image forming means mounted for receiving reflected electro-magnetic radiation from the surface of said ocean;

arcuate aperture means in the focal plane of said image forming means, said arcuate aperture being spaced from the optical axis of said image forming means such that a ray having the angle of incidence to the mean ocean

surface of greater than 57° will pass through the aperture; and



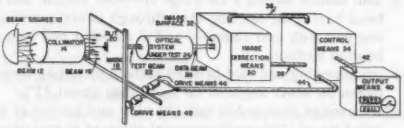
means for detecting the intensity level of said received reflected radiation.

3,938,892

ELECTRONIC OPTICAL TRANSFER FUNCTION ANALYZER

Edwin E. Klingman, III, Huntsville, Ala., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 24, 1973, Ser. No. 354,060
Int. Cl.² G01B 9/00; G01J 1/00
U.S. Cl. 356—124 12 Claims



1. An analyzer for obtaining the optical transfer function of an optical system under test comprising:

a. test beam source means for producing a collimated test beam incident on the optical system under test whereby the latter produces a data beam;

b. an image dissector tube having an image surface for receiving the data beam, and positioning coils responsive to an address signal for selecting which elemental area of the image surface determines the output signal whose amplitude is a measure of the intensity of light received by the selected elemental area;

c. address signal generating means for sequentially generating address signals that are applied to the positioning coils and are respectively associated with the various elemental areas of the image surface; and

d. storage means responsive to the output signals of the tube and to the address signal generating means for storing numbers representative of the light intensity on the various elemental areas at locations correlated with the addresses thereof.

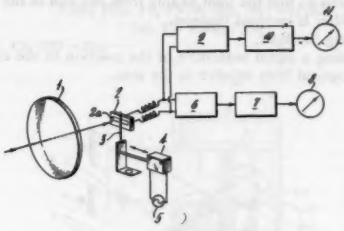
3,938,893

IMAGE FOCUSSING MECHANISM

Yasuhiro Nanba; Seiji Yamada, both of Sakai, and Motonobu Matsuda, Isumi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 4, 1974, Ser. No. 520,510
Claims priority, application Japan, Nov. 9, 1973, 48-126648
Int. Cl.² G01B 9/00
U.S. Cl. 356—125 8 Claims

8. An image scanning device for detecting a focussing condition by means of a scanning signal obtained by scanning an image formed through a lens, characterized in that the image is scanned by means of a photoelectric element and a light



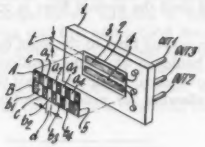
shielding needle element which shields a minor part of the light receiving surface of said photoelectric element.

3,938,894

FOCUS DETECTING DEVICE

Yasuhiro Nanba, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 12, 1974, Ser. No. 532,120
Claims priority, application Japan, Dec. 29, 1973, 49-1114
Int. Cl.² G03B 13/18
U.S. Cl. 356—125 12 Claims



1. A focus detecting element positioned at a plane intended to be focussed by a lens for receiving light through the lens to produce an electrical signal, characterized in that said element comprises at least one pair of photodiodes elongated in longitudinal directions parallel to each other, each of said photodiodes having a light receiving surface divided into a plurality of longitudinally spaced areas along the elongated direction of said photodiode, the areas of one of said pair of diodes being longitudinally offset with respect to the areas of the other of said pair of diodes.

3,938,895

METHOD FOR POSITIONING AN OPTICAL FIBER

Andrew Bridger, Brighton, and Mark L. Dakss, Waltham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 19, 1974, Ser. No. 498,804
Int. Cl.² G01B 11/26
U.S. Cl. 356—152 5 Claims

1. A method for positioning an optical fiber in a holder for subsequent use in coupling a pair of similarly mounted optical fibers together, the method comprising the steps of

defining an axis,

positioning an optical fiber holder main body such that a first external surface thereof is in a predetermined relationship to the axis and a second external surface is in another predetermined relationship to a point on the axis,

aligning an optical fiber essentially parallel with the axis,

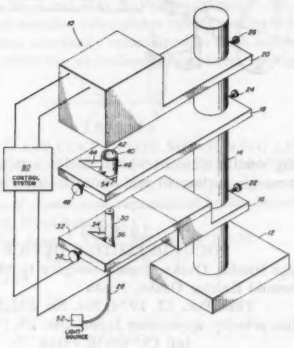
positioning the optical fiber along the axis so that the optical fiber is in juxtaposition to the main body over a portion of its length and an end of the optical fiber is at a position approximately at the point on the axis,

passing light through the optical fiber so that light exits from the end of the optical fiber,

positioning a position-sensitive photodetecting means on the axis so that the light exiting from the end of the optical fiber is incident thereon,

detecting the light,

generating a signal indicative of the position of the end of the optical fiber relative to the axis,



moving the optical fiber normal to the axis in response to the signal until the optical fiber is coaxial with the axis, and

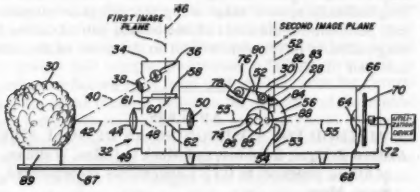
securing the optical fiber to the main body to form an optical fiber holder in which the position of the optical fiber is in a known relationship to at least two external surfaces thereby allowing for precise positioning of the optical fiber.

3,938,896

IMAGE COLORIMETER

Paul J. Selgin, Bethel, Conn., assignor to Neotec Corporation, Rockville, Md.

Filed Apr. 4, 1974, Ser. No. 457,846
Int. Cl.² G01J *3/34*
U.S. Cl. 356—179 **7 Claims**



1. An image colorimeter comprising:

an enclosure having a light source therein;

a first opening formed in the enclosure for permitting illumination of an exterior object by the source;

a second opening formed in the enclosure for admitting reflected light from the object to be focused on a first image plane defined internally of the enclosure;

a permanent standard device mounted in the enclosure and intersecting the first image plane;

the standard device oriented to reflect light from the source within the enclosure;

a second image plane defined in the enclosure for producing images from reflected light of the object and the standard device;

the second image plane being transverse to the reflected light from the object and the standard device, permitting formation of separate image areas of the object and the standard reference at the second image plane;

means located adjacent the second image plane for alternately varying the size of the image areas;

optical means located at the second image plane for projecting a beam, having components combined from the object and standard device images, along the enclosure; and

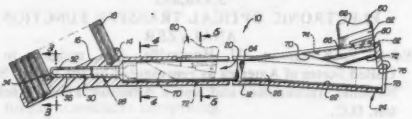
detecting means located in the enclosure for intercepting the beams and producing an electrical signal, in response thereto which varies in accordance with the respective brightness of the object and standard device images.

3,938,897

TOOTHBRUSH WITH DENTIFRICE CARTRIDGE

Burnie M. Craig, Pasadena, Calif., assignor to Loren S. Fond, Beverly Hills, Calif.

Continuation-in-part of Ser. No. 232,714, March 8, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 449,822
Int. Cl. A46b *11/04*
U.S. Cl. 401—155 **6 Claims**



1. In combination:

a. a brush having a handle and having at one end of said handle a head provided with a bristled surface;

b. said handle having a cartridge chamber therein and said head having an opening therethrough communicating at one end with said chamber and at its other end with said bristled surface;

c. said opening and said bristled surface including therebetween an acute angle of no more than about 45°;

d. a cartridge disposed in said chamber and having an elongated tip of elastomeric material disposed in said opening and projecting beyond said bristled surface, said tip having adjacent its terminus a self-closing slit; and

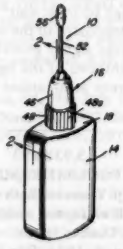
e. said opening and the axis of the terminal portion of said tip making an acute angle with the axis of said chamber and said cartridge.

3,938,898

SWAB APPLICATOR WITH ADAPTER CHUCK AND CLOSURE

Jack Reitknecht, 210 E. Broadway, New York, N.Y. 10002

Filed Apr. 5, 1974, Ser. No. 458,449
Int. Cl.² B05B *11/00*
U.S. Cl. 401—183 **6 Claims**



1. An applicator comprising a tubular member having a swab on one end thereof with the swab enclosing only a minor portion of the length of the tubular member and projecting slightly beyond said one end of the tubular member whereby

the swab is supported solely by the tubular member, the other end of the tubular member being open, said tubular member and swab having a passageway extending completely therethrough and terminating at the outer end of the swab to provide an uninterrupted, continuous passageway through the tubular member and swab for applying material to a surface, said tubular member being constructed of shape-sustaining material having sufficient flexibility to enable bending during application of material to a surface.

3,938,899

STYLOGRAPH

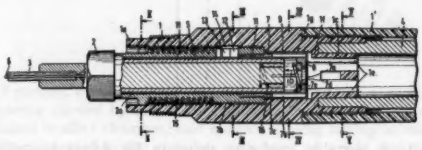
Otto Mutschler, Ludolf-Krehl Str. 21, D-69 Heidelberg, Germany

Filed May 5, 1975, Ser. No. 574,320

Claims priority, application Germany, May 8, 1974, 2422137

Int. Cl. B43k 8/00

U.S. Cl. 401—260 7 Claims



1. A stylograph comprising:

a. a tubular barrel member having an axis and being open in one axial direction;

b. a feed bar member formed with an axial bore and fixedly mounted in said barrel member;

c. a tubular stylus mounted on said feed bar member and projecting outward of said barrel member in said one axial direction;

d. a plunger mounted in said bore for axial movement toward and away from a predetermined position;

e. a pin secured on said plunger for joint axial movement and movably received in said stylus;

f. a retainer member mounted on said feed bar member and closing said bore in an axial direction opposite to said one direction,

1. said plunger and said retainer member axially bounding therebetween an air chamber in said bore in said predetermined position of the plunger, said plunger moving inward of said air chamber when moving away from said position thereof,

2. said plunger and said feed bar member radially bounding therebetween an annular gap of capillary dimensions in said bore, said gap axially connecting said air chamber with said stylus in all operative positions of said plunger;

g. means in said barrel member offset from said feed bar member in said opposite direction, and defining an ink reservoir,

1. at least one of said members being formed with a continuous capillary conduit communicating with said air chamber and having axially terminal portions directly communicating with said reservoir and said annular gap, a portion of said conduit extending over the entire axial dimension of said air chamber and by-passing said air chamber; and

h. means for admitting ambient air to said air chamber when ink flows from said reservoir to said stylus through said conduit and said gap.

3,938,900

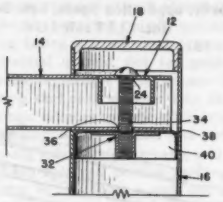
TUBE JOINING SYSTEM

Charles N. Apple, Sr., Greensboro, N.C., assignor to Metafab Industries, Inc., Greensboro, N.C.

Filed Feb. 11, 1974, Ser. No. 441,035

Int. Cl. E04g 7/00

U.S. Cl. 403—263 5 Claims



1. A joint formed from a plurality of members wherein the longitudinal axis of the members are out of alignment comprising; a first tubular member having an exterior surface defining at least one opening therein and an inner periphery, a second tubular member having an end portion extending through said opening into said first member toward the inner peripheral surface thereof, and means within said first member for releasably securing said first member to said second member including a first fastener member having a peripheral surface in abutting relation with said inner periphery of said member, and a second fastener member extending axially along said first tubular member and extending through said second member cooperatively coupled to said first fastener member for securing said first and second members together, said first fastener member is cup shaped and having a surface abutting said second member, and a peripheral surface extending axially of said first tubular member, and an aperture threadably receiving the end of said second fastener member within the cup.

3,938,901

LOCKING DEVICE FOR A BEARING RING OR THE LIKE

Ralph S. Howe, Jr., New Britain, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Oct. 1, 1974, Ser. No. 511,085

Int. Cl.² F16C 35/06

U.S. Cl. 403—350 20 Claims

1. Locking means for securing a bearing ring or the like to a cylindrical shaft, said ring having a cylindrical bore to fit the shaft and said ring having at one axial end a slot of limited axial length, whereby said ring is circumferentially discontinuous in an axial region of the slot and is therefore locally radially deformable in said axial region, said ring having at said axial region a circumferential contour characterized by a minimum radial extent at the angular region of the slot and by a maximum radial extent at a second angular region offset from said first-mentioned angular region to an extent less than 180°, and a circumferentially continuous locking collar having a bore conforming substantially to the said ring contour, said collar having an externally accessible formation engageable for relative angular displacement of said collar and ring to

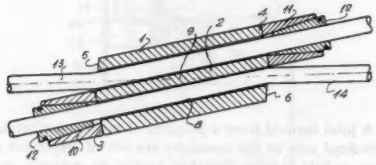
bring the second angular region of said ring into adjacency with the first angular region of said collar.

3,938,902

CONNECTING DEVICE FOR WIRES

Juan Coll Morell, Calle Amilcar 209, Barcelona, Spain

Filed Aug. 19, 1974, Ser. No. 498,618
Claims priority, application Spain, Feb. 26, 1974, 201309
Int. Cl.² F16B 2/14
U.S. Cl. 403—391 1 Claim



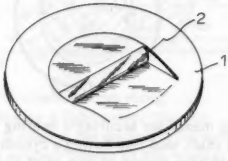
1. Connecting device for two wires which are to be placed under tension in series connection, having a rigid block which has two opposite ends and two substantially parallel bores extending from one end to the other to receive the wires, and two anchoring means respectively associated with the bores adapted to anchor the tensioned lengths of the wires respectively at the opposite ends of the block against the applied tension when the said tensioned lengths extend through the bores, the anchoring means comprising wedges received in tapering orifices and adapted to grip the wires, the said tapering orifices of the anchoring means being in members separate from the said rigid block and adapted to abut the ends of the block, each end face of the block having two facets through which respectively the said bores open, one of the facets being substantially perpendicular to the bore which opens through it and being for abutment by the associated anchoring means, and the other being at such an angle to the bore which opens through it that it is substantially perpendicular to a common axis of the connected wires.

3,938,903

HIGHWAY ROADMARKER WITH STUDDED BOTTOM

Paul B. Montgomery, Tyler, Tex., assignor to Ferro Corporation, Cleveland, Ohio

Filed Jan. 3, 1975, Ser. No. 531,792
Int. Cl.² E01F 9/04
U.S. Cl. 404—16 4 Claims



1. In a highway lane divider and roadmarker, adapted to be affixed to a pavement surface, said marker having a substantially planar base, the improvement of said base having a multiplicity of studs protruding therefrom in spaced relationship, said studs having substantially vertical sides, and bottom surfaces substantially parallel to said base, said studs protruding from said base from about 0.025 inch to about 0.1 inch, said studs spaced apart from each other a distance of from about 1/32 inch to about ¼ inch, said studs dispersed substantially symmetrically over the area of said base, with the total exposed surface area of said studs, exclusive of their bottom surfaces, representing at least 30% of the total surface area represented by said base and the bottom surfaces of said studs.

3,938,904

PASSAGE STRUCTURES FOR USE IN ACQUIRING THE TECHNIQUES FOR DRIVING MOTOR CYCLES

Toshiki Nishiyama, No. 78, 4-chome, Uwa-machi, Yokosuka, Kanagawa, Japan

Filed Feb. 1, 1974, Ser. No. 438,702
Int. Cl.² E01C 5/16
U.S. Cl. 404—35 15 Claims

1. A portable road-type structure for driver education which can be moved readily from one location to another which comprises a roadway, at least part of the surface of said roadway possessing a V-shape and at least part of the surface of said roadway containing an inverse V-shape, both of said shapes being inclined from the center of the roadway to both of the shoulders thereof, and a plurality of pylons installed in the roadway along the center lines thereof at substantially equally predetermined intervals along the longitudinal direction of the roadway, said portable road-type structure functioning as an educational tool for teaching an individual the fundamental knowledge and techniques for driving a motorcycle before being exposed to actual driving conditions.

3,938,905

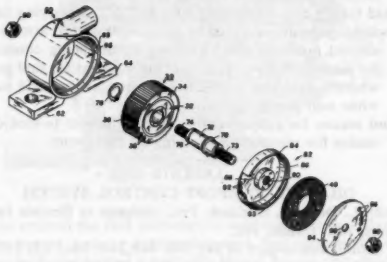
NOISELESS AIR-ACTUATED TURBINE-TYPE VIBRATOR WITH MUFFLER

Theodore S. Wadensten, P.O. Box 8 Stilson Road, Wyoming, R.I. 02898

Filed Jan. 2, 1974, Ser. No. 430,082. The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.
Int. Cl.² F01D 5/12
U.S. Cl. 415—119 12 Claims

1. A relatively silent, compressed gas-actuated, turbine-type vibrator having a rotor of not less than 1-1/4 inches and not more than 5½ inches diameter and when operated within a speed range of 6,000 to 10,000 rpms having a noise level not greater than 75 decibels hz., the vibrator including: (a) a substantially closed housing having a cylindrical chamber therein; (b) a dynamically unbalanced rotor freely rotatable in the cylindrical bore of the chamber, the diameter and length of the rotor being established so that not less than 1/32 of an inch clearance is provided between the rotor and ends and bore of the chamber, the rotor having a plurality of tooth-like configurations formed on its outer periphery, the tooth-like configuration further having a depth which corresponds to a distance not exceeding 7 percent and not less than 1½ percent of the diameter of the rotor; (c) an air outlet formed in the housing and extending from the rotor chamber to the outside of the housing; (d) an air inlet formed in the housing and extending from the outside of the housing to the rotor chamber, the air inlet arranged to direct the incoming pressurized

air tangentially against the teeth of the mounted rotor and with the tooth-like configuration so formed that in a plane normal to the axis of the rotor the face of the tooth-like configuration against which the incoming air impinges defining an angle of intersection with a theoretical radial line of said rotor, said defined angle being as little as zero and as great as 30° as measured from said point of intersection and inclined in such a direction that the circumferential thickness of the tooth-like configurations tend to decrease as the radial distance from the axis increases, the cross-sectional area of the inlet being 30 to



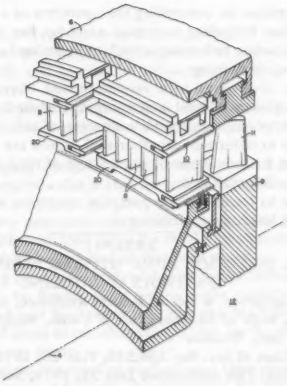
55 percent of the area of the outlet diameter; (e) a muffler housing carried by the turbine housing and providing an attached muffler chamber, said muffler housing having an inlet side connected to the chamber outlet and on a side opposite the inlet side into the muffler housing there is provided a closure plate having an outlet leading substantially directly to atmosphere, and (f) a porous muffler member carried in the muffler housing, this muffler member constructed so as to provide myriad paths for the effluent air while flowing through the muffler housing to its discharge from this muffler housing.

3,938,906

SLIDABLE STATOR SEAL

Frank Michel, Swarthmore, Pa., and Thomas M. Szewczuk, Claymont, Del., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 7, 1974, Ser. No. 513,002
Int. Cl.² F01D *11/00*
U.S. Cl. 415—139 **1 Claim**



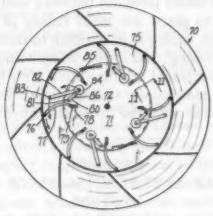
1. A seal structure for reducing leakage of a fluid between adjacent stationary shroud segments in a turbine comprising, a turbine casing, a blade ring disposed within said casing, an annular array of stationary blades disposed within said blade ring, said blades supported on their radially outer end by a plurality of arcuately formed outer shroud segments and on their inner ends by a plurality of arcuately formed inner shroud segments, said adjacent shroud segments defining gaps therebetween allowing dimensioned changes in said segments due to thermal causes, one end of each of said shroud segment having a slot defined by opposing radially spaced legs, said slot having an opening facing said adjacent segment, a movable seal member mounted in said slot for guided movement towards said adjacent segment, a spring means disposed within said slot for biasing said seal member into abutting sealing engagement with said adjacent segment for sealing said fluid against radial flow across said shroud and radially directed slots in said opposing legs of said segment, said sealing member having a radially enlarged portion received within said radial slots whereby, in conjunction with said spring means, said slot defined by said opposed spaced legs is sealed against axial flow therethrough.

3,938,907

HORIZONTAL MULTIDIRECTIONAL TURBINE WINDMILL

George S. Magoveny, and Eric J. Forgo, both of North Haven, Conn., assignors to Windsunwatt, Inc., New Haven, Conn.

Filed June 24, 1974, Ser. No. 482,355
Int. Cl.² F01D *7/00, 7/02*
U.S. Cl. 415—141 **2 Claims**

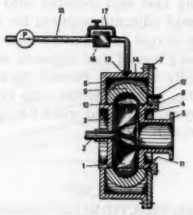


1. A horizontal multidirectional windmill comprising a fixed housing and a rotor, the housing being constituted by upper and lower horizontally disposed members and a plurality of vertically disposed vanes extending between said members adjacent the periphery thereof and lying at an angle from radial, each adjacent pair of vanes and the horizontal member surfaces therebetween forming a funnel to direct air inwardly with a tangential component, and the rotor being constituted by upper and lower horizontally disposed members lying in the planes of said housing members, a vertical axle to which said rotor members are secured, a plurality of buckets mounted between said rotor members and extending inwardly from the periphery thereof, each said bucket comprising a flexible vertically disposed surface portion and supports for the inner and outer edges of said portions, and means for varying automatically the distance between said supports as a function of rotational speed of the rotor, each of the upper and lower rotor members comprising a central element and an outer annular element, said elements being relatively rotatable, the supports for the inner edges of the buckets being carried by said central element and the supports for the outer edges being carried by said annular element, the distance varying means comprising at least one lever pivotally connected to at least one of said elements, and a weighted body mounted on said lever, said means being adapted to cause relative rotational movement of said elements.

3,938,908
PUMP

Siegfried Emilius Maria de Bree, Rotterdam, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Continuation of Ser. No. 340,741, March 13, 1973, abandoned. This application Oct. 10, 1974, Ser. No. 513,925
Claims priority, application Netherlands, Mar. 16, 1972, 7203503
Int. Cl.² F04D *7/00, 7/02*
U.S. Cl. 415—196 **2 Claims**

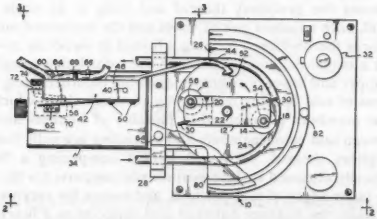


1. A pump having an outer casing and an inner casing of a brittle material and of unitary construction, a rotor mounted on a shaft and having an axial fluid passageway, said rotor being disposed in said inner casing, said outer casing comprising a cover surrounding said shaft and a cover surrounding said passageway, said inner casing radially outwardly overlying and axially overlapping both of said covers, and means to introduce a fluid under pressure between said inner and outer casings thereby to place the inner casing in compression to prestress the inner casing in opposition to fluid pressure peaks within the inner casing, said inner casing being of substantially U-shaped cross-sectional configuration with the legs of the U extending into sealed axially sliding contact one with one said cover and the other with the other said cover.

3,938,909
SINGLE NEEDLE ALTERNATING FLOW BLOOD PUMP SYSTEM

Charles B. Willock, 16222 SE. Oatfield Road, Milwaukie, Oreg. 97222

Division of Ser. No. 348,509, April 6, 1973, Pat. No. 3,848,592. This application June 24, 1974, Ser. No. 482,424
Int. Cl.² F04B *49/00, 43/08, 43/12, 45/06*
U.S. Cl. 417—12 **3 Claims**

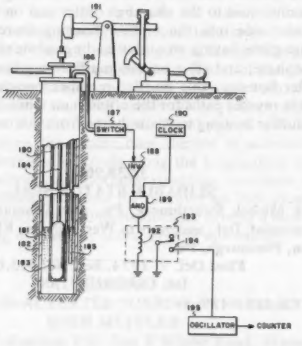


1. In blood pump including a guide for receiving a liquid-carrying tube, a rotor carrying rollers for bearing against said tube, and rotor drive means for rotating said rotor, the improvement comprising an attachment for said pump adapting said pump for use in a system for alternately withdrawing and returning blood via a single path, said attachment including:
mounting means for attachment relative to said blood pump,
an actuating arm pivotable with respect to said mounting means and having a first portion disposed in a path generated by a portion of said rotor whereby rotation of said rotor to a predetermined position pivots said arm from a first position to a second position,
a spring normally biasing said arm into said first position to be actuated by said rotor,
a clamping member disposed adjacent said arm and receiving a length of tubing between said arm and said clamping member such that said arm in its first position compresses said tubing against said clamping member and in said second position unclamping said tubing,
said tubing communicating with said liquid-carrying tube,
switching means operated by movement of said arm to said second position, said switching means being connected for interrupting power to said drive means for said pump, whereby said arm is effective for unclamping said tubing while said power is interrupted,
and means for subsequently restoring power to said drive means for reinitiating pumping by said pump.

3,938,910
OIL WELL PUMPOFF CONTROL SYSTEM

Bobby L. Douglas, Garland, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 469,264, May 13, 1974, which is a continuation-in-part of Ser. No. 365,881, June 1, 1973, Pat. No. 3,854,846. This application Nov. 1, 1974, Ser. No. 519,904
Int. Cl.² F04B *49/00*
U.S. Cl. 417—12 **21 Claims**



1. A system for controlling the operation of a well pumping installation including a pump, a motor for operating said pump, a sucker rod string, a walking beam and a pumped fluid flowpipe, comprising:
means responsive to a predetermined characteristic of a component of said well pumping installation;
means to generate signals indicative of said response;
means to determine whether said signals are occurring less than a predetermined percentage of time during a given time interval; and
means to terminate the pumping operation in the event of said lesser determination.

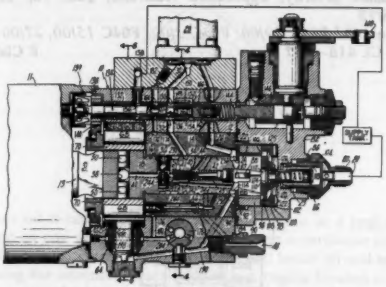
3,938,911
FUEL INJECTION PUMP WITH METERING VALVE CONTROLLED COOLING

Daniel Salzgeber, Windsor; Robert Raufeisen, and Charles W. Davis, both of Simsbury, all of Conn., assignors to Stanadyne, Inc., Windsor, Conn.

Division of Ser. No. 336,538, Feb. 28, 1973, Pat. No. 3,861,833. This application July 31, 1974, Ser. No. 493,242
Int. Cl.² F04B *3/00, 49/00, 19/02*
U.S. Cl. 417—252 **5 Claims**

1. A liquid fuel injection pump comprising a supply tank, a low pressure supply pump having an inlet connected to said

supply tank, a rotor mounting a high pressure pump which pressurizes measured charges of fuel for sequential delivery to the cylinders of an associated engine in timed relation therewith, a first passage connecting the outlet of said supply pump and said high pressure pump, a movable metering valve in said passage for controlling the restriction offered by a metering



port to control the fuel delivered to said high pressure pump, and a bypass passage connecting said first passage to said supply tank and having a normally closed bypass port opened by said metering valve as said metering valve approaches its closed position to continue the circulation of new fuel from said tank through the fuel injection pump whenever said metering valve is closed.

3,938,912

HORIZONTAL TYPE HYDROHOIST

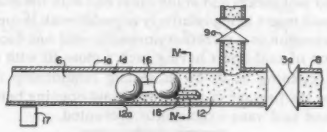
Masakatsu Sakamoto, Matsudo; Kenji Uchida, Kashiwa; Makoto Saito, Tokyo; Yasunori Yamada, Yokohama, and Yoshiyuki Takenaka, Kamakura, all of Japan, assignors to Hitachi, Ltd.; Showa Denko K.K. and Hitachi Sanki Engineering Co., Ltd., France

Filed Mar. 1, 1974, Ser. No. 447,357

Claims priority, application Japan, Mar. 2, 1973, 48-25887

Int. Cl.² F04B *17/00, 35/00*

U.S. Cl. 417—339 **13 Claims**



1. A horizontal type hydrohoist comprising:

a plurality of substantially cylindrical feed pipes arranged horizontally and in parallel relationship with respect to each other;

a drive liquid pump communicating with a drive liquid tank and connected at one end of said feed pipes by first valve means;

transport piping connected at the other end of said feed pipes by second valve means for transporting slurry under pressure;

a slurry pump communicating with a slurry tank and connected with said feed pipes by third valve means in the vicinity of said other end of said feed pipes;

return piping connected with said drive liquid tank and said feed pipes by fourth valve means in the vicinity of said one end of said feed pipes for returning the drive liquid in the feed pipes to said drive liquid tank by the slurry fed by said slurry pump;

separator means arranged in each of said feed pipes at the boundary portion between the slurry and the drive liquid so as to provide a small space between said separator means and the inner peripheral surface of said feed pipe;

and stopper means located at the portion of said feed pipes on the drive liquid feed side of the junction of said feed pipes and piping communicating said feed pipes with said slurry pump for stopping movement of said separator means such that one end of said separator means is lifted from the bottom of said feed pipes to permit drive liquid to pass under said separator means.

3,938,913

FLOW MACHINE FOR AN AGGRESSIVE, RADIOACTIVE OR SPECIAL-PURITY FLOW MEDIUM

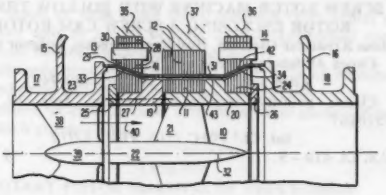
Gerhard Isenberg; Peter Bloch, both of Dachau, and Wolfgang Tuzinsky, Munich, all of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Germany

Filed Dec. 20, 1972, Ser. No. 316,899

Claims priority, application Germany, Dec. 20, 1971, 2163256

Int. Cl.² F04B *17/00*

U.S. Cl. 417—356 **28 Claims**



1. A flow machine for aggressive, radioactive, or special-purity flow mediums comprising:

machine casing means having inside walls which include a center section joined at both ends by respective conically outwardly flared sections,

rotatable impeller means with an outer configuration extending approximately parallel to said center section and said conical outwardly flared sections and arranged within said inside walls,

bearing support means for supporting said impeller means such that said impeller means is spaced at all points from the inside walls of said casing means, said bearing support means including magnetic material housed in the respective conical sections of said impeller means, a plurality of electro-magnets spaced from one another around the circumference of said inside walls, and electrical means for supplying electrical current to said electro-magnets, whereby both radial and axial support is provided to said impeller means by way of the respective components of magnetic force acting along the conical sections.

3,938,914

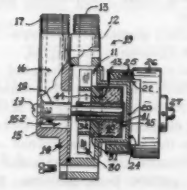
PUMP IMPELLER AND COUPLING MAGNET STRUCTURES

Frederick N. Zimmermann, Deerfield, Ill., assignor to March Manufacturing Company, Glenview, Ill.

Continuation of Ser. No. 679,777, Nov. 1, 1967, abandoned. This application Aug. 18, 1969, Ser. No. 854,019

Int. Cl. F04b *17/00, 35/04*

U.S. Cl. 417—420 **18 Claims**



1. In a magnetically coupled pump of the type having a rotary impeller and conjoined, driven, one-piece cylindrical

coupling magnet with a longitudinal bore and formed of a magnetic composition of the frangible type susceptible to fracture and like faulting, and rotating coaxially with the impeller with its cylindrical surface closely confronting an enclosure wall portion located in a narrow clearance space subjoining said surface in the magnetic air gap between the magnet and a cooperative driving magnet rotated externally of said wall portion, the combination with said driven magnet of guard means comprising substantially non-magnetic circumambiently extending restrictive band means substantially encircling the magnet body in a direction about the cylindrical aspect thereof to confine at least portions thereof in case of fracture or faulting, as aforesaid, against dislocation in a direction particularly toward said clearance space, the outermost periphery of said band means lying close to the outer periphery of the magnet body well within said clearance space.

3,938,915
SCREW ROTOR MACHINE WITH HOLLOW THREAD ROTOR ENCLOSING A SCREW CAM ROTOR

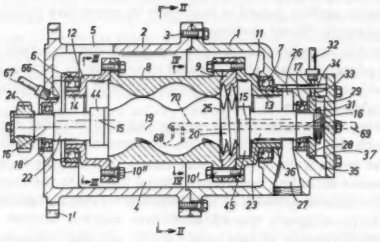
Hans Kristoffer Olofsson, Huddinge, Sweden, assignor to Atlas Copco Aktiebolag, Huddinge, Sweden

Filed July 18, 1974, Ser. No. 489,940

Claims priority, application Sweden, July 20, 1973, 7310167

Int. Cl.² F01C 1/16; F04C 17/12

U.S. Cl. 418—9 **9 Claims**



1. In a screw rotor machine for compressible working medium including a screw cam rotor provided with gudgeons, a hollow screw thread rotor provided with bearing surfaces and enclosing the screw cam rotor, the rotors being journalled in a housing for respective rotation around parallel mutually displaced rotation axes, the rotors forming chambers for the working medium between their screw cam and screw threads which chambers move from end to end of the rotors during their rotation while changing their volumes, the improvement enabling high working loads with short sealing lengths and small leakage losses while maintaining simple rotor screw profiles comprising:

a circularly profiled single-thread-screw cam rotor having two parts with different lead angles,

the single-thread-screw being generated in relation to an inner base cylinder formed by the centers of the circular rotor cross sections taken along the screw cam rotor axis and having a diameter amounting to two times the distance between the rotation axes,

the single-thread-screw cam rotor circular profile enclosing, in each cross section, both the inner base cylinder and cylindrical extensions of the gudgeons the relation between the distance between the rotation axes and the radices of the cam rotor profile amounting to a value between 0.2 and 0.4.

3,938,916
GAS SEAL FOR VANE TYPE INTERNAL COMBUSTION ENGINE

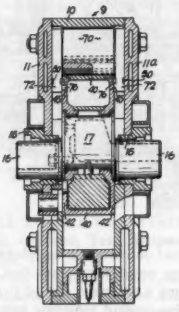
Tony Ralph Sarich, 2 Hadley Place, Karrinyup, Western Australia, Australia

Filed Jan. 16, 1974, Ser. No. 433,747

Claims priority, application Australia, Jan. 16, 1973, 1916/73

Int. Cl.² F01C 19/00; F03C 3/00; F04C 15/00, 27/00

U.S. Cl. 418—137 **8 Claims**



1. An internal combustion engine having a housing, a shaft mounted for rotation relative to the housing, a piston member carried by said shaft, a housing face on said housing, a piston face on said piston member in spaced opposed relationship to said housing face, a plurality of vanes arranged to form with said housing and said piston member a plurality of chambers which vary in capacity in response to relative rotation between said shaft and said housing, each said vane having a vane extension interposed between said housing face and said piston face, seal means on one of said faces adjacent to said vane extension, walls defining an opening in said vane extension at said seal means, said opening extending through said vane extension between said faces, an insert mounted in said opening and extending therethrough in a direction normal to said one of said faces, said insert being in engagement at one end with said seal means and at the other end with the other of said faces, said insert being relatively movable with respect to said vane extension in a direction normal to said one face, at least a portion of said insert having such a close fit with said walls of said opening as to be in sealing relationship therewith, whereby the passage of gas through said opening between said insert and said vane extension is prevented.

3,938,917
LINEAR OIL SEAL MEANS PRINCIPALLY INTENDED TO OBTAIN AN OIL SCRAPING EFFECT

Nobutaka Morimitsu, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 10, 1973, Ser. No. 423,146

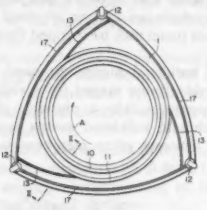
Claims priority, application Japan, July 17, 1973, 48-79810

Int. Cl.² F01C 19/08; F04C 27/00

U.S. Cl. 418—142 **5 Claims**

1. In a rotary piston engine including a polygonal rotor containing side walls and having a plurality of apex portions with a corner seal being provided at each apex portion, at least one annular oil seal means and side seal means, said annular oil seal means comprising an annular oil seal groove disposed in the side wall portion of the rotor, said oil seal groove containing an annular oil seal ring resiliently supported by a spring means, said annular oil seal ring housing an annular elastic means which intercepts an annular space left between said annular oil seal ring and said annular oil seal groove, said side seal means comprising a linear groove disposed in the side wall portion of said rotor and extending between two adjacent corner seals provided at respective apex portions of said linear groove containing a linear sealing element resiliently supported by a spring means, the improvement which comprises

providing a linear oil seal means which extends between said annular oil seal means and said side seal means, said linear oil seal means comprising a linear groove disposed in the side wall portion of said rotor, said linear groove containing a linear sealing element resiliently supported by a spring means, said linear oil means joining said side seal means in a region located on one side of a line which connects a particular corner seal with the central axis of the rotor, said linear oil seal means joining the annular oil seal means in a region located on the other side of said line said one side preceding the corner seal, as seen in the direction of rotation of the rotor.



3,938,918

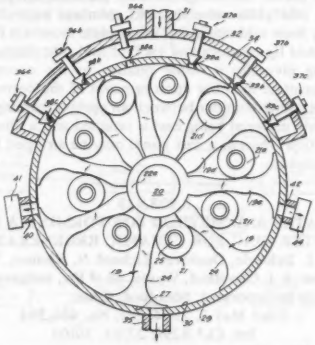
ROTARY VANE DEVICE

John Snygg, 433 Prospect St., and Vello H. Ebrok, 410 Prospect St., both of East Orange, N.J. 07017

Filed Apr. 16, 1974, Ser. No. 461,413

Int. Cl.² F04C *3/00*

U.S. Cl. 418—150 **15 Claims**



2. In an eccentric rotor vane device having a main chamber having a substantial cylindrical interior surface, first and second ports spaced around and communicating with said main chamber, a plurality of angularly related radial vanes independently pivotal and rotatable within said main chamber about a vane axis therewithin, said vanes occupying substantially the total radial distance from said axis to said interior surface of said main chamber, a rotor that is eccentrically mounted with respect to said main chamber and rotatable about a rotor axis spaced from said vane axis. said rotor having vane guides for interdigitating and accurately engaging and guiding said vanes as said rotor and said vanes are rotated within said main chamber, and a power delivery shaft connected with said rotor for delivering power in association therewith, the improvement wherein each of said confronting vane surfaces has a contour with respect to the longitudinal (x) axis of the vane and the transverse axis (y) of the vane which is substantially defined by the following:

$$x(\phi) = x_{DE}(\phi) + \rho[y_{DE}(\phi) + x_{DE}(\phi)\cdot s_O(\phi)]/[r(\phi) \quad 1+(s_O.$$
$$(\phi))^2]$$
$$y(\phi) = y_{DE}(\phi) - \rho[x_{DE}(\phi) - y_{DE}(\phi)\cdot s_O(\phi)]/[r(\phi) \quad 1+(s_O.$$
$$(\phi))^2]$$

where

$$O \quad \phi \quad \pi$$
$$x_{DE}(\phi) = r(\phi)\ \mathrm{Re}\ \exp\ (i\alpha(\phi))$$
$$y_{DE}(\phi) = r(\phi)\ \mathrm{Im}\ \exp\ (i\alpha(\phi))$$
$$r(\phi) = \quad R^2+c^2-2cR\cos\phi$$

$$\exp\ (i\alpha(\phi)) = (-1)^m \prod_{k=1}^{n} \frac{[(c(k)\,f(k,\phi)-a)-i\ s(k)\ f(k,\phi)]}{[f^2(k,\phi)\ -2ac(k)\ f(k,\phi)\ +a^2]^{1/2}}$$

$c(k) = \cos\ (2k\ \Delta\phi)$

$s(k) = \sin\ (2k\ \Delta\phi)$

$\Delta\phi = 2\pi m/(2n+1)$ where m and n are positive integers such that m and $2n+1$ have no common divisors

$f(k,\phi) = \cos\ (2k\ \Delta\phi) - (c/R)\cos\phi$

$a = (\frac{1}{2})[1 - (c/R)^2]$

$$s_o(\phi) = [a\cdot r^2(\phi)/R^2]\cdot \sum_{k=1}^{n} s(k)/[f^2(k,\phi)-2ac(k)\,f(k,\phi)+a^2]$$

R = radius of vane guide circle (distance from center of rotor axis to center of right circular cylindrical vane guide surface which engages vane).

c = distance between vane axis at center of main chamber and rotor axis at center of vane guide circle.

ρ = radius of right circular cylindrical vane guide surface which engages vane.

3,938,919

ROTARY PISTON MACHINE OF TROCHOIDAL CONSTRUCTION

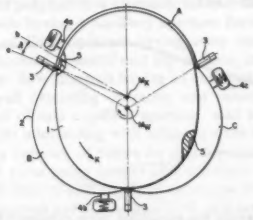
Franz Huf, Constance, and Jurgen Lambrecht, Ebenhausen, both of Germany, assignors to Dornier System GmbH, Germany

Filed Jan. 29, 1975, Ser. No. 545,184

Claims priority, application Germany, Feb. 5, 1974, 2405307

Int. Cl.² F04C *29/08*

U.S. Cl. 418—183 **6 Claims**



1. In a rotary piston machine of trochoidal construction for compressing a gaseous medium having working chambers between a trochoidal piston and a housing corresponding to the coordinated outer envelope curve, said working chambers being separated from each other by radial seals in the housing, and outlet openings closed-off by means preventing backflow for discharging medium from the working chambers,

the improvement comprising trough-shaped recess means in the peripheral piston surface which, in the dead center position of the piston, are positioned immediately ahead of a radial seal.

3,938,920

DEVICE FOR LIMITING THE PRESSING FORCE TO A PRE-ESTABLISHED VALUE IN MECHANICAL PRESSES

Roland Fleissner, Bichi, Germany, assignor to Dorst-Keramikmaschinen-Bau, Kochel, Germany

Filed Feb. 11, 1974, Ser. No. 440,994

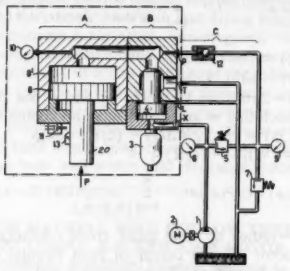
Claims priority, application Germany, Feb. 12, 1973, 2306747

Int. Cl.² B29C *3/00*

U.S. Cl. 425—78 **14 Claims**

1. A device for limiting the pressing force to a pre-estab-

lished value in a mechanical press, said press having an upper punch mount, hydraulic cushion means mounting said upper punch mount, a reservoir for hydraulic fluid and a prime mover driven pump and conduit means connecting said pump to said hydraulic cushion, a first pressure relief valve in said



conduit, said device characterized in that a relief duct is provided interconnecting said hydraulic cushion and said reservoir; a second pressure relief valve in said duct, said second pressure relief valve being adjustable for varying the maximum hydraulic pressure exerted by said hydraulic cushion means.

3,938,921

MOULDS

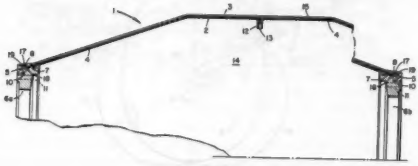
George Atkins, Sutton Coldfield, and Philip J. Evans, Birmingham, both of England, assignors to Dunlop Limited, London, England

Filed Aug. 11, 1972, Ser. No. 279,752

Claims priority, application United Kingdom, Aug. 12, 1971, 37837/71

Int. Cl.[2] B29D *3/02*

U.S. Cl. 425—111 **15 Claims**



1. Apparatus for moulding wire reinforced rubber articles comprising a moulding surface said surface being a peripheral surface of a multi-piece mould, said mould being constructed of a material having a greater coefficient of expansion than said wire, at least one spacer element being provided between at least two adjacent mould pieces, said element comprising a material which is thermoplastic and softens at the temperature of said moulding, whereby during the moulding said element is caused to flow by the expanding mould pieces and thereby compensate for the expansion of the mould material.

3,938,922

MEANS FOR FORMING A PRESTRESSED SLAB INCLUDING COLLAPSIBLE BULKHEADS

Fred Darroll Godley, Charlotte, N.C., assignor to Modular Wall Systems, Inc., Charlotte, N.C.

Division of Ser. No. 186,837, Oct. 6, 1971. This application Mar. 28, 1974, Ser. No. 455,749

Int. Cl.[2] B28B *23/04*

U.S. Cl. 425—111 **5 Claims**

1. An apparatus for forming and curing cast panels comprising:

an elongate bed defining a horizontal planar surface for supporting material being cast,

side form means for facilitating stripping of a cast panel and including a pair of stationary support means extending parallel and in spaced relation to said bed and a pair of slip form means engaging corresponding ones of said support means for movement vertically relative to said bed and said support means between a forming position wherein material cast between said slip form means is retained therebetween and an elevated release position wherein a cast panel may be stripped from said apparatus, and

a plurality of bulkhead means disposed transversely between said side frame means for dividing material cast into said apparatus into a plurality of discrete panel lengths, each said bulkhead means being defined by a plurality of discrete plate members including a lower

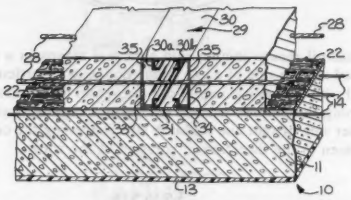


plate member, a pair of side plate members supported on said lower plate member and an upper plate member normally overlying said pair of side plate members, said plate members having stop means for normally arranging said plate members to define a hollow box structure, said stop means including inwardly directed lip portions of said side plate members and members extending vertically from said upper and lower plate members for engaging said lip portions and each of said side plate members being pivotally movable relative to the corresponding lower plate member upon removal of the corresponding upper plate member between an upright forming position whrein material being cast is retained and a tilted release position wherein a cast panel may be stripped from said apparatus.

3,938,923

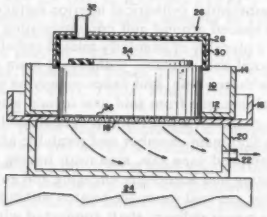
APPARATUS AND METHOD FOR FORMING A SEALED OUTER RING FOR CERAMIC REGENERATOR

Chester J. Dziedzic, Dushore; Richard N. Kleiner, Towanda, and Joseph J. Cleveland, Wysox, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 2, 1974, Ser. No. 466,394

Int. Cl.[2] B29C *27/14, 30/00*

U.S. Cl. 425—127 **6 Claims**



1. Apparatus for forming a gas-impervious ceramic seal within a predetermined number of the peripheral cells of a ceramic honeycomb structure having first and second opposing surfaces defining the cell openings and having an outer wall surrounding the cells, while simultaneously forming a ceramic layer on the outer wall, the apparatus comprising:

a. a first reservoir adapted to receive the structure and a castable ceramic composition, the reservoir having a bottom portion defining an opening corresponding in

shape to the cross section of the structure and having an area at least equal to the area of the first surface, and having side walls of a height at least equal to the height of the outer wall of the structure;

b. first removable gas-impervious slurry-impervious contact means adapted for gas-impervious contact with a central portion of the second surface, for forming a temporary vacuum seal of the central portion cells, and leaving the peripheral cells exposed;

c. a second reservoir adapted for positioning atop the structure and having outer walls adapted for contact with the outer walls of the structure, for maintaining a ceramic slurry composition in contact with the exposed cells of the second surface;

d. second removable gas-pervious slurry-impervious contact means adapted for contact with at least the cell openings of the first surface corresponding to the exposed cell openings of the second surface;

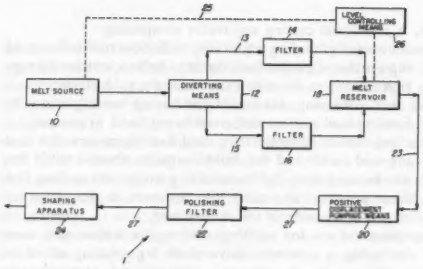
e. vacuum means positioned below the second contact means in contact therewith, adapted for evacuating the exposed peripheral cells through the second contact means, to promote flow of slurry into the evacuated cells, thereby to at least partly impregnate and seal these cells against gas flow; and

f. vibrator means positioned below the vacuum means and in contact therewith for vibrating the apparatus to promote flow of the casting and slurry compositions.

3,938,924
THERMOPLASTIC MELT APPARATUS

Richard M. Abella, Cranford, N.J.; Keith D. Dodson, and Jerry G. Richardson, both of Greenville, S.C., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,763
Int. Cl.² B29B 5/02
U.S. Cl. 425—147 **16 Claims**



1. An assembly for the continuous filtration and transport of a thermoplastic melt from a melt source to a shaping apparatus comprising:

a melt source providing a continuous flow of a thermoplastic melt;

a diverting means disposed downstream of said melt source providing communication for said melt between said melt source and at least two parallel disposed conduits;

at least two parallel disposed conduits, each provided with a removeable filter means, wherein said thermoplastic melt stream is filtered;

a melt reservoir in communication with the downstream end of each of said parallel conduits, said reservoir providing a pool for storage of a fixed volume of said filtered thermoplastic melt;

a level controlling means, in control communication with said melt reservoir and said melt source said level controlling means regulating the melt output of said melt source as a function of the level in said melt reservoir to insure a uniform melt flow to said melt reservoir;

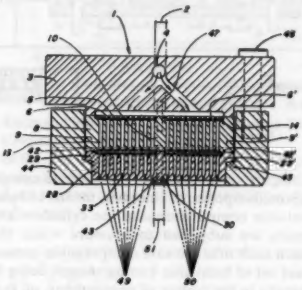
a positive displacement pumping means in communication with the outlet of said reservoir, said pumping means providing the motive force to provide a uniform rate of flow of said melt to a shaping apparatus; and

said shaping apparatus in communication with the discharge out of said positive displacement pumping means, for shaping said thermoplastic melt, which flows into said shaping apparatus at a uniform rate, into a shaped article.

3,938,925
SPIN PACK ASSEMBLY

Robert Lees, Chester, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 11, 1974, Ser. No. 505,182
Int. Cl.² B29F 3/04
U.S. Cl. 425—198 **16 Claims**



9. A spinneret plate for the extrusion of synthetic filaments, comprising:

a. a top and a bottom surface; and

b. a plurality of polymer flow channels, each of said polymer flow channels having a capillary aperture formed in said plate, said capillary aperture having a top end, said top end being located beneath said top surface; and each of said polymer flow channels having an enlarged inlet comprising a wall extending upwardly and outwardly from said top end of said capillary aperture, said wall of said enlarged inlet intersecting with adjacent walls in a closed, interlocking network of ridges on said top surface;

said spinneret plate being further characterized in that the longitudinal axes of said capillary apertures of said polymer flow channels are perpendicular to said surfaces; said walls of said enlarged inlets are continuous, smooth surfaces of curvature which exhibit a converging pattern while proceeding from said top surface to said top ends of said capillary apertures; and said ridges of said enlarged inlets define a plurality of equilateral polygonal sectional areas selected from the group consisting of triangles, squares and hexagons.

3,938,926
PIZZA PIE FORMING MACHINE

Joseph Fraioli, Sr., 300 Martine Ave., White Plains, N.Y. 10601

Filed Oct. 16, 1974, Ser. No. 515,082
Int. Cl.² A21C 11/00
U.S. Cl. 425—233 **5 Claims**

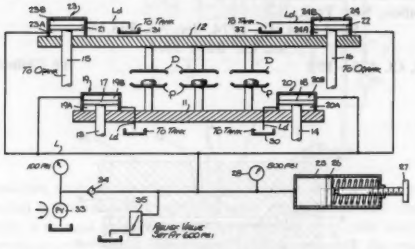
1. A machine for shaping dough pieces into pies suitable for pizzas, said machine comprising:

A. upper and lower platens in spaced, parallel relation for supporting a pie-shaping die and a dough-piece pan, respectively,

B. a crank mechanism for reciprocating both platens concurrently to effect engagement between the die and pan and to effect disengagement therebetween, said crank

mechanism including crank rods which stroke up and down and are coupled to the platens to effect the reciprocating motion thereof; and

C. a hydraulic system for subjecting said dough piece to uniform fluidic pressure in the course of engagement, said system including cylinders mounted on at least one of said platens and movable therewith, each cylinder having a piston slidable therein, which piston is connected to a respective crank rod and acts to divide the associated cylinder into a front-side and a rear-side compartment whereby the cylinders are provided with a set of front-side compartments and a set of rear-side compartments, a compressible pressure chamber, means coupling the set of front-side compartments of the cylinders which compartments are subjected to pressure when the platens approach each other to said compressible pressure chamber, said set of front-side compartments being filled with oil whereby in the course of engagement, oil from the set of front-side compartments is forced into the chamber and is returned to the set of front-side compartments in the course of disengagement, and means connecting the set of rear-side compartments to the atmosphere whereby the set of rear-side compartments is filled with air.



3,938,927

APPARATUS FOR THE CONTINUOUS MANUFACTURE OF CHIPBOARD PANELS, FIBRE PANELS OR THE LIKE

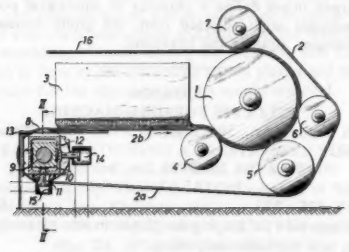
Heinz Brinkmann, Bennigsen; Rolf Gersbeck, Ronnenberg, and Eckart Schlomach, Hannover, all of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

Filed Apr. 22, 1975, Ser. No. 570,454

Claims priority, application Germany, Apr. 25, 1974, 2420029

Int. Cl.[2] B29J *5/08*

U.S. Cl. 425—373 **7 Claims**



1. In apparatus for the continuous manufacture of pressed panels of particulate material, a heated and rotatable press drum, a tensioned endless belt onto which a ribbon of particulate material treated with a binder can be fed, an inlet roller positioned adjacent said drum such that said belt with said ribbon of particulate material thereon passes between the inlet roller and the drum, at least one return roller for said belt to press said belt against said drum and thereby to press said ribbon of particulate material between said belt and said drum, a tensioning and control roller for said belt, said tensioning and control roller being so spaced and disposed with respect to said inlet roller that, between said tensioning and control roller and said inlet roller, said belt extends in a substantially horizontal pass, and means positioned above said substantially horizontal pass of said belt to feed said particulate material onto said substantially horizontal pass of said belt.

3,938,928

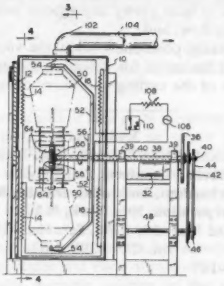
MULTIPLE MOLD ROTARY CASTING APPARATUS

Alvadore M. Andrews, deceased, late of Portland, Oreg. by The United States National Bank of Oregon, executor

Filed Jan. 24, 1974, Ser. No. 436,191

Int. Cl.[2] B29C *5/04*

U.S. Cl. 425—430 **14 Claims**



1. A rotational casting apparatus comprising:

mold means including a plurality of hollow molds for molding synthetic plastic material into hollow articles by rotation of said molds when they contain said plastic;

an oven enclosing said molds and having heating means for heating said molds, said oven being fixed in position;

cooling means separate from said heating means, for cooling said molds and the molded articles therein while they are in said oven by transmitting moist air cooling fluid from an external source into the oven in the space surrounding outside of the molds; and

rotation means for rotating said molds within said oven, including a common drive shaft for rotating all of the molds about a common axis, a plurality of rotor means for rotating each of said molds about its mold axis at an angle to said common axis, and support means for supporting each of said molds on said common drive shaft so their mold axes extend radially and are circumferentially spaced about said common axis.

3,938,929

FLEXIBLE PLASTICS HOSE MAKING APPARATUS

Vernon Dennis Stent, and Derek Cecil Wright, both of Woking, England, assignors to Creators Limited, England

Division of Ser. No. 355,593, April 30, 1973, Pat. No. 3,890,181. This application Dec. 12, 1974, Ser. No. 532,227

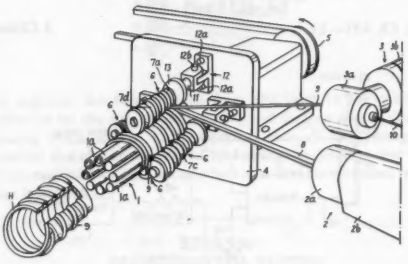
Claims priority, application United Kingdom, Nov. 27, 1972, 54636/72

Int. Cl.[2] B29C *27/28*

U.S. Cl. 425—501 **4 Claims**

1. An apparatus for manufacturing a flexible plastics hose wherein a strip of a first plastics material is extruded, a reinforcing element of a second plastics material is simultaneously extruded, said strip is wound into a helix around a driven mandrel while the plastics material is still in a plastic condition

and adjacent turns are bonded together by pressure applied between said mandrel and roller means external thereof to form a tubular wall of said plastics material, said reinforcing element being simultaneously wound around said helix of said first plastics material in spaced helical turns having the same pitch angle as said helix of first plastics material while the reinforcing element is guided into said spaced helical turns and is pressed into the first plastics material by said roller means so as to partially embed said reinforcing element into said tubular wall and to feed the tubular wall with the reinforcing element partially embedded therein axially of the mandrel, said apparatus comprising a mandrel around which the extruded strip of plastic material and the reinforcing element are to be wound, said mandrel comprising a plurality of mandrel rollers which are circumferentially equi-spaced on a circle around and extend substantially parallel to the center axis of the mandrel, means for driving said mandrel rollers in the same direction and at the same speed, and a plurality of roller assemblies disposed at circumferentially spaced positions around said mandrel for pressing the plastics materials against



the mandrel to bond the turns of the strip of plastics material together and to partially embed the reinforcing element in said plastics material, each said roller assembly comprising a plurality of roller sections rotatable about a common axis, each independently of other roller sections of a roller assembly, each roller assembly being disposed opposite a mandrel roller with its axis intersecting a radial line from the center axis of the mandrel through the axis of said opposing mandrel roller and inclined to said center axis of the mandrel, tangentially of the mandrel, at an angle equal to the pitch angle of the helical turns of the reinforcing element of the hose to be made, each roller section having a portion formed with a guide groove for receiving the reinforcing element with adjacent guide grooves of an assembly being spaced apart by a distance corresponding to the pitch of the helical turns of the reinforcing element and the diameters of at least the grooved portions of the roller sections increasing in the direction of hose formation, and successive roller assemblies in the direction of winding of the plastics materials being so positioned axially of the mandrel that the guide grooves thereof locate with the turns of the reinforcing element around the hose being made.

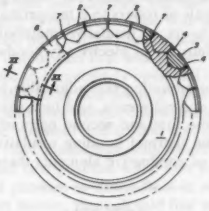
3,938,930

EXPANSION SHIM FOR HOT BRIQUETTE ROLL SEGMENTS

William L. Lauterbach, Upper St. Clair Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 26, 1973, Ser. No. 409,833
Int. Cl.² B29C *15/00*
U.S. Cl. 425—472 **2 Claims**

1. A shim for use in hot briquette machines having peripheral mold segments on mold rolls comprising a sheet of alloy having a melting point no higher than the temperature at which the mold segments achieve their greatest expansion under operating conditions, said sheet having a profile similar



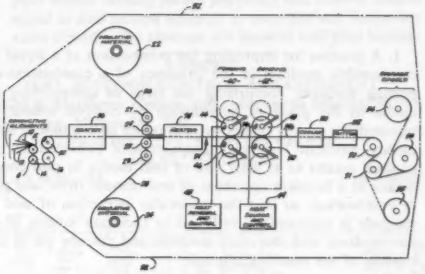
to the profile of a mold segment of said hot roll briquette machine.

3,938,931

APPARATUS FOR INSULATING ELECTRICALLY CONDUCTIVE ELEMENTS

Leroy L. Emmel, Costa Mesa, Calif., assignor to Fortin Laminating Corporation, San Fernando, Calif.

Division of Ser. No. 93,949, Dec. 1, 1970, Pat. No. 3,802,974.
This application Dec. 19, 1973, Ser. No. 426,246
Int. Cl.² B29C *27/22, 27/30;* **B30B** *3/04, 7/00*
U.S. Cl. 425—505 **5 Claims**



1. An apparatus for simultaneously insulating a plurality of electrically conductive elements with thermal bonding insulative material comprising:

a heater adapted to receive the combination of two layers of thermal bonding insulative material and a plurality of electrically conductive elements positioned therebetween, said heater being adapted to heat the thermal bonding insulative material to a pliable temperature below bonding temperature, to give the insulative material plasticity and to relieve internal stresses therein;

a first pair of rollers adapted to receive the heated combination of the two layers of thermal bonding insulative material and the plurality of electrically conductive elements positioned therebetween, at least one roller of said first pair of rollers having an outer surface formed with alternating recesses and ridges which engage and form the layers of insulative material about the plurality of electrically conductive elements;

heat removal and control means for cooling at least one of said first pair of rollers to conduct and remove heat from and to solidify and stabilize the layers of thermal bonding insulative material with the plurality of conductive elements positioned therebetween;

a second pair of rollers in tandem with said first pair of rollers, said second pair of rollers being adapted to receive the layers of thermal bonding insulative material formed about the plurality of electrically conductive elements, at least one roller of said second pair of rollers having an outer surface formed with alternating recesses

and ridges which engage the layers of insulative material formed around the plurality of electrically conductive elements;

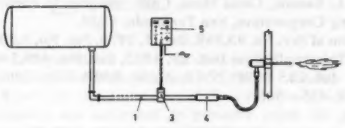
heat source and control means for heating at least one of said second pair of rollers to a temperature which bonds the formed layers of insulative materials together and around the plurality of electrically conductive elements; and

frame means for mounting said adjustable heater; said heat removal and control means, said heat source and control means, and the first and second pairs of rollers and for supporting the thermal bonding insulative material and the plurality of conductive elements therebetween.

3,938,932
PROCESS FOR IMPROVING THE COMBUSTION OF SOLID

Luciano Benzan, c/o Busenco Establishment, Via Ortona 5, 47036 Riccione (Forli), Italy

Filed Feb. 4, 1974, Ser. No. 439,019
Int. Cl.² F23D 21/00
U.S. Cl. 431—2 **11 Claims**

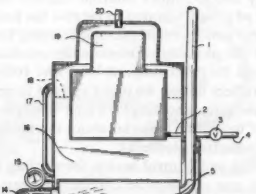


1. A process for improving the combustion of a liquid fuel combustible medium in the presence of a combustion-supporting medium, comprising the steps of transporting said media to the place of combustion by conduit means; and transmitting energy pulses by resonating an aluminum sleeve having efficient resonant characteristics provided on said conduit means to at least one of said media in said conduit means at a location upstream of and remote from said place of combustion, so that the molecular attraction of said one medium is substantially reduced to facilitate mixing of said one medium with the other medium and thereby aid in combustion of the resulting mixture.

3,938,933
FUEL OIL BURNING METHOD

Gregorio Cardenes Armas, Las Palmas (Canary Islands) Paraguay, 7, Spain

Filed June 11, 1973, Ser. No. 368,582
Int. Cl.² F23J 7/00
U.S. Cl. 431—4 **4 Claims**



1. A method of burning fuel-oil comprising the steps of:

injecting fuel-oil into a tank partly filled with hot water maintained at approximately 90°C;

allowing the fuel-oil to rise through the hot water to form a separate layer of fuel-oil in the top of said tank while preheating said fuel-oil to a temperature of approximately 90°C;

withdrawing fuel-oil from said layer;

heating the thus withdrawn fuel-oil to a temperature of approximately 300°C;

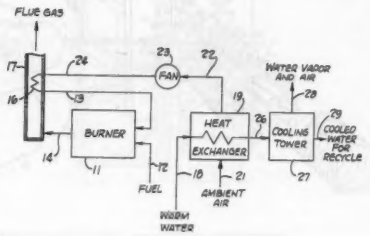
injecting the heated fuel-oil into an open-ended mixing chamber of a combustion chamber while simultaneously injecting into said mixing chamber a separate jet of water so that an intimate mixture of fuel-oil and water is formed; and

supplying to the open end of said mixing chamber sufficient air to support combustion of the said mixture.

3,938,934
FUEL ECONOMIZER PROCESS AND APPARATUS

William A. Frondorf, Rocky River, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 521,974
Int. Cl.² F23D 11/44
U.S. Cl. 431—11 **4 Claims**



1. A process for heating cool combustion air feed to a fuel burner at an installation having a source providing a stream of warm water to be cooled for recycle use and means for evaporative cooling of said warm water, the improvement for reducing the load on said evaporative cooling means and for utilizing heat in said warm water stream comprising:

indirectly exchanging heat from said stream of warm water to said air, and dispatching resulting warmed air to said burner, said heat exchange from said stream of warm water to said air taking place prior to evaporative cooling of the warm water.

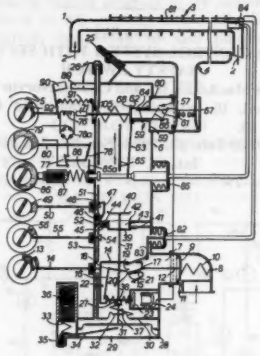
3,938,935
CONTROL SYSTEMS FOR GASEOUS FUEL FIRED APPLIANCES

Harald Engelbert, London, England, assignor to Radiation Limited, London, England

Filed Nov. 19, 1973, Ser. No. 417,284
Claims priority, application United Kingdom, Nov. 17, 1972, 53239/72
Int. Cl.² F23Q 9/08
U.S. Cl. 431—47 **17 Claims**

1. A control system for a gaseous fuel fired appliance, said system comprising a gaseous fuel flow control means including a first flow control member for controlling fuel flow from a fuel inlet to a fuel outlet, a passage between said fuel inlet and outlet by-passing said first flow control member, a second flow control member for controlling fuel flow along said passage, a movable member, means for actuating said movable member, a linkage interconnecting the movable member and the first flow control member for transmitting to the latter movement of the movable member, means for varying the ratio of movement of the movable member to movement of the first

flow control member, means for moving both the first flow control member and the second flow control member as a unit between an "off" position in which fuel flow from said inlet to said outlet and along said passage is prevented and an "on" position in which said fuel flow is permitted and from which on position further movement of the first flow control member



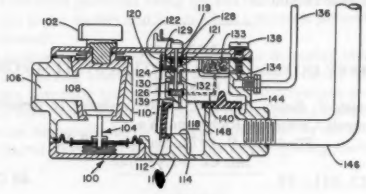
to regulate the flow of fuel from the inlet to the outlet is effected by the movable member, and further means for adjusting the effective cross-sectional area of the passage to control the maximum rate of fuel along the passage and thus from said inlet to said outlet when said first flow control member is closed.

3,938,936

FLUID CONTROL SYSTEM

George Vizmeg, West Covina, Calif., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sept. 5, 1974, Ser. No. 503,554
Int. Cl.[2] F23Q 9/08
U.S. Cl. 431—51 2 Claims



1. A fluid control system for use with combustion apparatus comprising:

a valve assembly having primary and secondary valves in series between an inlet and an outlet of said assembly;

a main burner in said combustion apparatus connected to said valve assembly outlet;

a pilot burner for said combustion apparatus positioned adjacent said main burner, said valve assembly having fluid flow conduits including first and second passages connected to said pilot burner;

means to sense a flame at the pilot burner and to generate a first control signal in the presence of a flame and a second control signal in the absence of a flame;

a third valve movable between first and second positions, when in said first position directing fluid through said first passage to said pilot burner; and when in said second position directing fluid through said second passage to said burner and preventing fluid from flowing through said first passage;

a first actuator for selectively operating said primary valve including means to open said valve to permit the passage of fluid from a first chamber to a second chamber of said assembly; said first fluid flow passage being in communication with said first chamber and said second fluid flow passage being in communication with said second chamber, with said pilot burner flame sensing means providing a selected one of said first and second control signals to said actuator to respectively open and close said primary valve, the closure of said primary valve in the absence of a flame at said pilot burner discontinuing flow of fluid to said second chamber and to said second flow passage;

said primary valve means including means to lock said third valve in said first position when said primary valve is in said closed position to direct fluid in said first chamber, to said pilot burner, through said first passage, the opening of said primary valve means in response to a sensed pilot burner flame releasing said locking means to place said third valve in its second position to close said first fluid flow passage and to open said second fluid flow passage to thereby communicate said pilot burner with said second chamber, the subsequent closure of said primary valve discontinuing flow of fluid into said second chamber and into said second fluid flow passage to said pilot burner; and

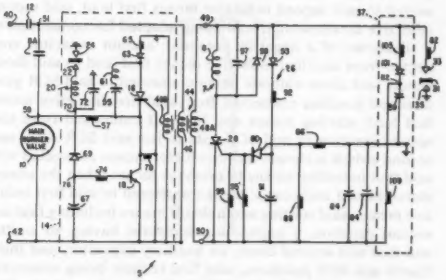
a second actuator for selectively operating said secondary valve including means to open said valve in response to a demand for heating in a space served by said combustion apparatus to permit passage of fluid from said second chamber of said valve assembly to said main burner, said pilot burner sensing means providing said second control signal to said second actuator to maintain said secondary valve closed in the absence of a flame at said pilot burner.

3,938,937

FUEL IGNITION CONTROL ARRANGEMENT

Russell B. Matthews, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Dec. 7, 1973, Ser. No. 422,692
Int. Cl.[2] F23H 5/08
U.S. Cl. 431—78 18 Claims



1. In an automatic fuel ignition system including valve means operable when energized to permit a gaseous fuel to be supplied to burner apparatus in response to a thermostatically-controlled means, an arrangement comprising control means including first timing means responsive to said thermostatically-controlled means for effecting energization of said valve means to permit fuel to be supplied to the burner apparatus, igniting means including spark producing means responsive to energization of said valve means to produce ignition sparks for igniting fuel supplied to the burner apparatus when said valve means is in fuel supplying condition to establish a flame, and second timing means responsive to said thermostatically-controlled means for controlling said first timing means for de-energizing said control means after a predetermined timing interval whenever a flame fails to be established within said timing interval, said control means including flame sensing means responsive to the ignition of the fuel supplied to the

burner apparatus to override said second timing means for enabling said control means to maintain said valve means energized, and further flame sensing means responsive to the ignition of the fuel supplied to the burner apparatus for de-energizing said spark producing means.

3,938,938

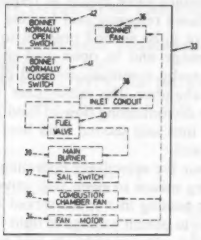
IGNITION SYSTEM AND COMPONENTS THEREOF

Elmer A. Carlson, Agoura, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 447,889, March 4, 1974, Pat. No. 3,870,929. This application Nov. 25, 1974, Ser. No. 526,742

Int. Cl.² F23N 5/12

U.S. Cl. 431—78 **12 Claims**



1. A spark ignitor for a combustible fuel, said ignitor comprising: a first junction; a first switch for connection to a conductor having a positive potential to said first junction; first and second inductive means each having first and second leads; a charging resistor connected from said first junction to said first inductive means first lead; a second switch for closure after said first switch is connected in parallel with said charging resistor; a silicon-controlled rectifier (SCR) having an anode, a cathode and a gate, said anode being connected from said first inductive means second lead; a diode having an anode connected from said SCR cathode, and a cathode connected to said second inductive means first lead, said second inductive means second lead being adapted for connection to a conductor of a negative potential; a main capacitor connected from said first inductive means first lead to said diode anode; said diode cathode being connected to said SCR gate; a second junction connected from said first inductive means first lead; starting means and hold off connected from said second junction to said SCR gate to fire said SCR when said second switch is closed; and conductor means connected with said first inductive means to establish an arc when the energy stored in said main capacitor is transferred to said first inductive means, said starting and hold off means including first and second resistors, a unijunction transistor having an emitter and first and second bases, an auxiliary capacitor, and third, fourth and fifth junctions, said first resistor being connected between said second and third junctions, said second resistor being connected between said third and fourth junctions, said SCR anode being connected from said fourth junction, said transistor second base being connected from said third junction, said transistor emitter being connected from said fifth junction, said auxiliary capacitor being connected from said fifth junction to said SCR gate, said transistor first base being connected to said SCR gate, said first and second inductive means including first and second transformers, respectively, each said transformer having primary and secondary windings, said first transformer primary winding having first and second ends connected to said first and second leads of said first inductive means, respectively, said second transformer primary winding having first and second ends connected to said first and second leads of said second inductive means, respectively, each of said secondaries having first and second leads, said conductor means including first and second spaced conductive structures, said first transformer primary having said first and second leads thereof connected to said first and second spaced conductive structures, respectively, to establish an arc therebetween, a main fuel burner, a gas valve having a winding actuable to supply fuel to said burner, said structures being in proximity to said burner to ignite fuel emanating therefrom by said arc, and means connected from said second transformer primary for actuating said valve.

3,938,939

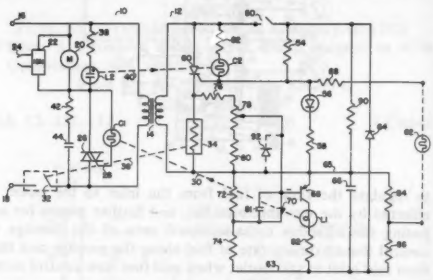
BURNER CONTROL SYSTEM WITH SECONDARY SAFETY SWITCH

Robert Bruce MacAskill, Jr., and Charles Norvin Porter, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 12, 1975, Ser. No. 549,409

Int. Cl.² F23N 5/08

U.S. Cl. 431—79 **14 Claims**



1. A burner control system having: a primary circuit including a switch for connecting the burner motor to a line voltage and a secondary circuit responsive to a thermostat and a flame detecting means, comprising:

circuit breaker means for disconnecting the burner motor from the line voltage wherein said circuit breaker means includes: a current sensitive element in the secondary; and

a fail safe means for activating said circuit breaker means in the event the switch for connecting the line voltage to the burner should fail.

3,938,940

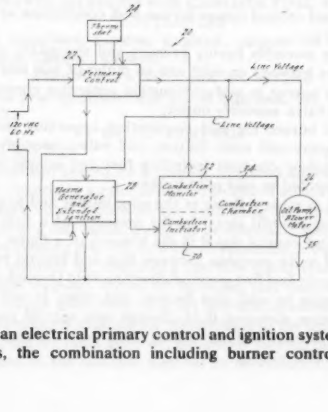
PRIMARY CONTROL AND IGNITION SYSTEM FOR OIL BURNERS

Frederick T. Bauer, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 9, 1975, Ser. No. 539,914

Int. Cl.² F23N 5/08

U.S. Cl. 431—79 **40 Claims**



1. In an electrical primary control and ignition system for oil burners, the combination including burner control means

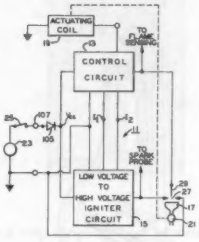
adapted to be connected to a main line source of AC current, a low voltage control circuit including burner ignition detection means, means providing a substantially lower voltage than line voltage in said control circuit, means in said low voltage control circuit including solid state means effective to actuate said burner control means, means interfacing between said low voltage control circuit and said burner control means, plasma generating means adapted to be connected to said main line source of AC current, and combustion initiation means operatively connected to said plasma generating means.

3,938,941

CONTROL SYSTEM

Jaykishan C. Patel, Clinton, Iowa, assignor to General Electric Company, Fort Wayne, Ind.

Filed Sept. 9, 1974, Ser. No. 504,252
Int. Cl.² F23N *5/12*
U.S. Cl. 431—80 **28 Claims**



1. A low voltage control system for a fuel burner having a fuel valve and adapted to be operable from a direct current and comprising:

means for actuating the fuel valve to enable flow of a combustible fuel from the burner;

means for spark igniting the fuel emitted from the burner;

means for detecting a flame disposed near the burner, the impedance between the detecting means and a point of reference potential being greater when no flame is present at the burner and lower when a flame is present at the burner;

a semiconductor device coupled to the detecting means for conducting current only when the impedance between the detecting means and the point of reference potential is lower thereby to indicate the presence of a flame; and

means responsive to the current conducted by the semiconductor device for disabling the spark igniting means.

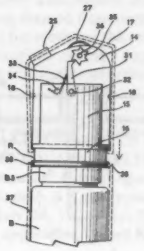
3,938,942

PYROPHORIC GAS LIGHTER

Jean Francois Torassa, Nice, France, assignor to S.A.R.L. Publigam, Morteau, France

Filed Mar. 8, 1974, Ser. No. 449,376
Claims priority, application France, Mar. 9, 1973, 73.10410; Nov. 9, 1973, 73.41898
Int. Cl.² F23Q *2/16*
U.S. Cl. 431—142 **5 Claims**

1. A pyrophoric lighter comprising a head, means for mounting said head freely on the spring-urged stem of the valve of a can of pressurized inflammable fluid, said head having a passage therethrough for said inflammable fluid from said valve stem to a point outside said head, a striking wheel for rotation against a flint carried by the lighter head to direct sparks toward said point to ignite fluid passing through said passageway to said point, whereby pressure on said head in the direction of a said container depresses the said valve stem to initiate flow of gas through said passageway, the release of said pressure permitting said head to move away from the container under the urging of the spring of said valve stem thereby to discontinue the flow of said fluid, and guide means for guiding said head on said container, said guide means comprising an intermediate piece comprised by a pair of legs that rest on a said container and that support between them means for rotating said wheel upon movement of said head toward said container.

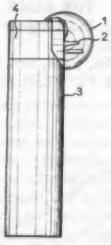


3,938,943

SECURITY DEVICE FOR A PORTABLE LIGHTER

Jean Gaston Malamoud, Annecy, France, assignor to S.T. Dupont, Paris, France

Filed Feb. 28, 1974, Ser. No. 447,050
Claims priority, application France, Mar. 1, 1973, 73.07291
Int. Cl.² F23Q *25/00*
U.S. Cl. 431—150 **6 Claims**

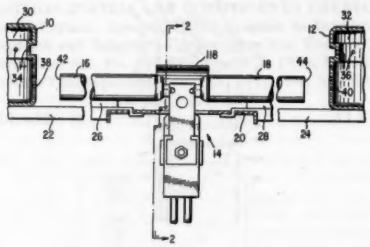


1. A security device for a lighter having an externally operated actuator lever for opening and closing a valve, and a flint wheel in spaced relation adjacent said actuator lever, said security device comprising a security member secured to the lighter and including means arranged in proximity to the actuator lever and flint wheel for preventing operation of the actuator lever and substantially closing the space between the flint wheel and the actuator lever to prevent access therebetween, said security member being separable from the lighter to free the actuator lever, said means for preventing operation of the actuator lever including a first portion abutting against said lever from below to prevent downward operation thereof and a second portion attached to said first portion and extending upwardly therefrom to be interposed in the space between said lever and flint wheel to prevent access to said space while enclosing the actuator lever from above.

3,938,944
ELECTRIC IGNITION ASSEMBLY

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 14, 1974, Ser. No. 469,720
Int. Cl.² F24C *3/10*
U.S. Cl. 431—191 **14 Claims**

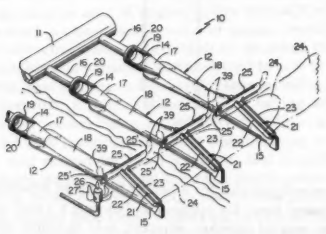


1. An electric ignition assembly for a plurality of burners comprising
an electric resistance igniter element;
a hood surrounding the igniter element;
said hood having a plurality of openings;
a plurality of flash conduits, each flash conduit extending between a respective burner and the hood in alignment with a respective opening in the hood for directing unignited fuel from the respective burner into the hood;
said resistance igniter element being spaced within the hood a predetermined distance away from alignment with each respective conduit and opening; and
means for diverting a portion of a respective stream passing through each opening from each respective conduit toward the igniter element.

3,938,945
BURNER CONSTRUCTION AND METHOD OF MAKING THE SAME

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 16, 1974, Ser. No. 515,231
Int. Cl.² F23D *13/02*
U.S. Cl. 431—191 **12 Claims**

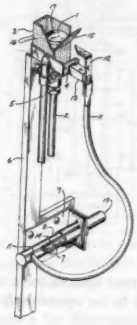


1. A burner construction comprising a tubular member having an inlet for receiving fuel from a supply thereof and having an outlet for issuing and burning a main flow of said received fuel to produce a main flame means at said outlet, said outlet being elongated and having opposed ends, and a deflector means carried by said tubular member adjacent one end of said outlet for directing some of said received fuel substantially transverse of said tubular member to create ignitor flame means substantially transverse to said tubular member for igniting said main flow of fuel at said outlet to create said main flame means, said deflector means being adapted to deflect said received fuel to each side of said tubular member to create said ignitor flame means at both sides of said tubular member, said deflector means comprising a substantially U-shaped member disposed in substantially an inverted position on top of and substantially transverse of said tubular member whereby said inverted U-shaped member has a pair of depending spaced apart legs joined together at the tops thereof by an arcuate section and said deflected fuel flow is adapted to issue from opposed ends of said U-shaped member, said U-shaped member having a tab that extends from the bottom of one of said legs and projects into said outlet of said tubular member to defect said main fuel flow into said U-shaped member.

3,938,946
IGNITION ENHANCER FOR STARTING PILOT BURNERS

Edward G. Phlaum, Kankakee, Ill., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Feb. 7, 1975, Ser. No. 547,869
Int. Cl.² F23Q *3/00*
U.S. Cl. 431—264 **4 Claims**



1. An ignition enhancer for pilot burners and the like, which comprises a pilot burner, means supplying gas to the pilot burner, a gas diffuser housing having a plurality of apertures in at least one wall thereof and disposed around the pilot burner, means securing the housing to a support, one of the walls of the housing having the apertures therein being slanted outwardly at an angle of approximately forty-five degrees from the vertical to confine a pocket of gas beneath the slanted wall when gas is supplied to the burner and passes through the slanted wall, an igniter electrode capable of providing a spark secured beneath the slanted wall of the housing substantially in line with the pilot burner but located within tolerance limits in any direction of plus or minus one-eighth inch with respect to the pilot burner without adversely affecting the spark ignition of gas supplied to the pilot burner.

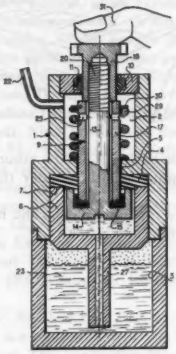
3,938,947
DEVICE FOR FEEDING AN EXPANDED GASEOUS FUEL TO A BURNER NOZZLE FOR INSTANCE OF A LIGHTER AND LIGHTER SUCH AS A CIGARETTE LIGHTER PROVIDED WITH SUCH A DEVICE

Claude Roland Julius Rosenthal, Paris, France, assignor to Uniflam, Societe Anonyme, Societe Universelle des Flammes, Luxemburg

Filed Dec. 4, 1974, Ser. No. 529,578
Claims priority, application France, Dec. 10, 1973, 73.44028
Int. Cl.² F23D *13/04*
U.S. Cl. 431—344 **16 Claims**

1. A feeding device for supplying expanded fuel gas to a burner nozzle for instance of a lighter, comprising a sealed or fluid-tight casing divided by a resilient sealing element into a pair of chambers the first one of which communicates with said burner nozzle whereas the second one contains liquified

gas under pressure, a valve member formed with a cylindrical bearing area portion inserted in sealing relationship through a cylindrical aperture formed in said sealing element and axially displaceable within said casing, a compressible porous member forming a pressure reducing means which is mounted in said second chamber onto said valve member and is connected through a passageway duct to said first chamber, wherein the improvement consists in that that end portion of said valve member which is located within said second chamber comprises a cup-shaped head in which is disposed said porous member which in a first axial position of said valve member within said casing is separated from said liquified gas under pressure by said head pressed in sealing engaging relationship against said resilient element and which in a second axial position of said valve member in which said head is spaced away from said sealing element, is fed with liquified gas under pressure and supplies said burner nozzle with expanded gas through the medium of said passageway duct and said first chamber.



3,938,948

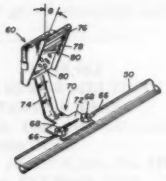
COOKING SYSTEM

Lewis Frank Moore, and George McNair Price, both of Shreveport, La., assignors to The Frymaster Corporation, Shreveport, La.

Division of Ser. No. 223,443, Feb. 4, 1972, Pat. No. 3,809,062. This application Mar. 1, 1974, Ser. No. 447,691

Int. Cl.² F23D *13/12*

U.S. Cl. 431—347 **2 Claims**



1. A burner comprising:

a gas supply manifold;

at least two orifices secured to the manifold for discharging gas jets in such directions that the gas jets and secondary air entrained therein interact to cause turbulent intermixing of the gas and the air;

a bracket mounted on the manifold and secured against relative movement with respect thereto by the orifices; and

target means mounted on the bracket and positioned at least partially in the path of the interacting jets to deflect the jets and thereby cause further turbulent intermixing of the gas and the air;

said target means comprising a ceramic member having a planar surface facing generally toward the jets and extending angularly with respect thereto;

said bracket being formed from metal and comprising bifurcated portions for receiving the orifices, means for receiving and retaining the ceramic target member and means for preventing wilting due to extended exposure to heat.

3,938,949

METHOD AND APPARATUS FOR BURNING PULVERULENT MATERIALS

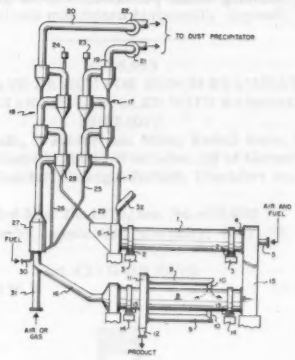
Soren Bent Christiansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed July 24, 1974, Ser. No. 491,620

Claims priority, application United Kingdom, July 31, 1973, 36378/73

Int. Cl.² F27B *15/16*

U.S. Cl. 432—14 **25 Claims**



1. A method of burning pulverous or granular material in a plant including a suspension preheater, a rotary kiln and a separate rotary cooler unit, said cooler unit having a central cooler tube provided with a plurality of cooler tubes arranged in planetary fashion about the central cooler tube, the kiln having an inlet end portion and an outlet end portion for cooling the burnt material by means of air subsequently used for combustion and preheating purposes in the plant, which comprises directing cooling air into the planetary cooler tubes and from the planetary cooler tubes into the central cooler tube, dividing the heated cooling air into at least two streams within the central cooler tube, directing the divided heated cooling air out of both ends of the rotary cooler unit in its divided streams, directing at least one stream to the rotary kiln to be used as combustion air, directing exhaust gases from the rotary kiln to the preheater to preheat the material, and directing the other stream of heated cooling air to the preheater to preheat the material prior to being burnt in the rotary kiln.

4. A rotary kiln plant for burning pulverous or granular material comprising a suspension preheater, an inclined rotary kiln and a separate rotary cooler, the rotary cooler having a central cooler tube provided with a plurality of cooler tubes arranged in planetary fashion about the central cooler tube and being connected at one end by at least one duct to the lower end of the rotary kiln and communicating at the other end portion with the suspension preheater, means for directing cooling air to the planetary cooler tubes and from the planetary cooler tubes to the central cooler tube in such a

manner that the heated cooling air from said rotary cooler is divided into two streams, means for directing a first stream of said preheated cooling air to the rotary kiln for use as preheated combustion air, means for directing the second stream to the suspension preheater for preheating the material to be burnt in the kiln, and means associated with the rotary kiln for directing the hot product from the kiln to the rotary cooler.

3,938,950

STRIPPING APPARATUS

Ernest A. Weiler, Rochester, and Rabin Moser, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1974, Ser. No. 451,311

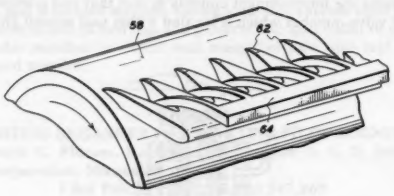
Int. Cl.[2] B65H *29/56*

U.S. Cl. 432—59 **5 Claims**

1. In an apparatus for contact fusing toner particles to paper support material wherein said apparatus comprises fusing roll for applying heat and pressure to the particles and paper support material at a nip through which they are passed therethrough, an improved stripping apparatus for stripping sheets from the fuser roll surfaces comprising:

blade retaining means positioned in close proximity to a fuser roll surface from which copy sheets are to be stripped,

a flexible blade member supported by said blade retaining means at an angle of about **20°** to **30°** to the fuser roll surface longitudinally coextensive therewith,



said blade member having a hollow ground edge at the tip thereof of a radius slightly greater than the fuser roll surface,

wherein said blade retaining means and blade member are arranged with inter-locking tines.

3,938,951

METHOD OF OBTAINING TITANIUM TANNING AGENT AND ITS APPLICATION FOR TANNING HIDES, PELTS AND FUR SKINS

David Lazarevich Motov, ulitsa Fersmana, 18, kv. 19; Vladimir Ivanovich Konstantinov, ulitsa Fersmana, 18, kv. 44; Vladimir Georgievich Rumyantsev, Zapadnaya ulitsa, 3, kv. 56; Valentin Ivanovich Belokoskov, ulitsa Fersmana, 16, kv. 19; Eduard Osvaldovich Ude, ulitsa Fersmana, 22, kv. 12; Artur Grigorievich Babkin, ulitsa Fersmana, 18, kv. 34, all of Apatity, Murmanskoi oblasti; Alexandr Ivanovich Metelkin, Nagornaya ulitsa, 46/48, korpus 20, kv. 31, Moscow; Vasily Georgievich Suchkov, Leninsky prospekt, 87a, korpus 4, kv. 48, Moscow; Nina Ivanovna Koleshikova, Izmailove, Nikitinskaya ulitsa, 31, kv. 31, Moscow; Alexandr Vasilievich Motovilin, ulitsa Dzerzhinskogo, 185, kv. 55, Taganrog, Rostovskoi oblasti; Nina Trofimovna Rusakova, ulitsa Redneva, Ia, kv. 71, Vladivostok; Tatyana Vladimirovna Nikonova, bulvar Generala Karoysneva, 7, korpus 6, kv. 32, Moscow; Nina Ivanovna Polyaninova, ulitsa Dezerzhinskogo, 174"A", Tanganrog; Mikhail Grigorievich Sinenko, ulitsa Dezerzhinskogo, 183, kv. 21, Taganrog Rostovskoi oblasti; Irina Fedorovna Krylova, Komsomolsky prospekt, 19, kv. 36, Moscow, and Vladimir Mikhailovich Yakutin, ulitsa Dzerzhinskogo, 185, Taganrog, Rostovskoi oblasti, all of U.S.S.R.

Division of Ser. No. 343,120, Dec. 11, 1972, Pat. No. 3,852,431, which is a continuation of Ser. No. 20,133, March 16, 1970, abandoned. This application Mar. 20, 1973, Ser. No. 343,120

Int. Cl.[2] C14C *3/04*

U.S. Cl. 8—94.25 7 Claims

1. A method of tanning delimed pelts using ammonium titanyl double sulfate monohydrate as tanning agent wherein said tanning agent in dry form is introduced into the tanning bath so that at the initial stage of the tanning process the agent is introduced in an amount of from 2 to 5 per cent of the pelt weight as referred to the percentage of TiO_2, while at the final stage of the tanning process, upon draining the tanning liquor and penetrating of the pelt by the tanning agent, it is introduced in an amount of from 5 to 8 per cent of the pelt weight as referred to the percentage of TiO_2 and wherein said tanning agent is prepared by dissolving titanium-containing material in sulfuric acid to form a solution containing titanium ions; adding ammonium sulfate to said solution in an amount of 180 to 300 g/l and adjusting the content of H_2SO_4 to 300 g/l while keeping the aggregate concentration of ammonium sulfate and H_2SO_4 to from 520 to 620 g/l in order to precipitate substantially all the titanium from said solution as ammonium titanyl double sulfate monohydrate at a temperature of 12° to 30°C.; removing said precipitate, washing said precipitate with a solution containing 300 to 450 g/l H_2SO_4 and 180 to 300 g/l of $(NH_4)_2SO_4$; and then washing the precipitate with a solution containing 300 to 400 g/l of ammonium sulfate.

3,938,952

METHOD AND MEANS FOR MULTI-COLORED DYEING TEXTILE YARNS

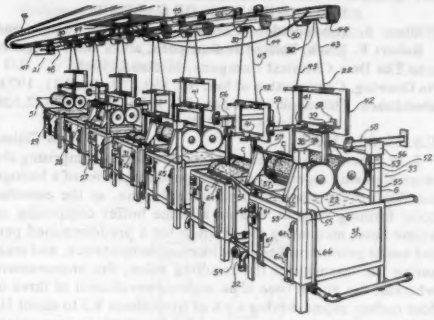
William Allen McNeill, Gastonia, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Aug. 20, 1974, Ser. No. 498,961

Int. Cl.[2] D06F *17/02*

U.S. Cl. 8—149 27 Claims

1. A method of multi-color dyeing textile yarn comprising progressively advancing a batch of textile yarn contained in a perforate container through the steps of positioning said container to have a horizontally disposed axis along which the yarn is disposed in an axially progressing tortuously coiled maze, immersing said positioned container sequentially in each of a plurality of dye baths with the immersion in at least one of two sequential dye baths of said plurality being to a depth less than the full extent of the batch of yarn in said container so as to have dye applied to only a portion of the



batch in said at least one dye bath, while disposing the container in a different dyeing disposition in each of said two dye baths with said axis maintained horizontally disposed.

3,938,953

PROCESS AND DEVICE FOR BLOOD EXAMINATION USING SUBSTANCES LABELLED WITH RADIOACTIVE NUCLIDES

Stratos Paschalis, Frankfurt am Main; Rudolf Kern, Mainz, and Karl-Friedrich Mück, Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 28, 1974, Ser. No. 474,056

Claims priority, application Germany, May 30, 1973, 2327576

Int. Cl.[2] G01N *33/16*

U.S. Cl. 23—230 B 11 Claims

1. In a process for determining the concentration of a hormone in a measured amount of liquid which comprises adding thereto measured amounts of radioactively-labelled hormone and of a hormone-binding protein or antibody, contacting the liquid mixture with an ion exchange resin for adsorbing unbound hormone, and then determining the residual radioactivity of the liquid mixture, the improvement wherein said liquid mixture is introduced into a measuring vial, the measuring vial is connected to an adsorption vial formed from a mixture of a thermoplastic resin and an ion exchange resin adsorbing said hormone, the connected measuring and adsorption vials are sealed, the liquid mixture is brought into contact with the walls of the adsorption vial for adsorption of unbound hor-

mone, and the liquid mixture is then drained into said measuring vial for determination of residual radioactivity.

3,938,954

DETERMINATION OF CALCIUM

William S. Stavropoulos, Carmel; Bernard J. Thiegs, and Robert F. Mack, both of Indianapolis, all of Ind., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation of Ser. No. 350,278, April 11, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,528

Int. Cl.² G01N *33/16*

U.S. Cl. 23—230 B 8 Claims

5. In a method for determination of calcium comprising the steps of mixing together predetermined quantities of a biological fluid, orthocresolphthalein complexone, as the essential color forming reagent, and an alkaline buffer comprising an amine base, incubating the mixture for a predetermined period under predetermined conditions of temperature, and measuring the intensity of the resulting color, the improvement wherein: the amine base is an aminoloweralkanol of three or four carbon atoms, having a pK of from about 9.3 to about 10, and wherein the ingredients are mixed together in proportions sufficient to provide a pH of from about 10.1 to about 10.7 in the ultimate mixture.

3,938,955

NONDESTRUCTIVE METHOD FOR QUICKLY DETERMINING AMOUNT OF LUBRICANT ON TEXTILE

Allison Maggiolo, Greensboro, N.C., assignor to Glen Raven Mills and Lee H. Peery, both of Glen Raven, N.C., part interest to each

Filed Jan. 20, 1975, Ser. No. 542,688

Int. Cl.² G01N *33/36, 23/10, 33/28*

U.S. Cl. 23—230.3 16 Claims

1. A nondestructive testing method for quickly measuring the amount of a coating applied to a strand, said method employing a radiation analysis instrument having a predetermined field and being adapted for quantitatively measuring a tracer, said method comprising applying to a running length strand a coating composition containing a tracer, winding the coated strand into a package of infinite mass relative to the field of the analysis instrument, and subjecting the package to analysis by the instrument to obtain a reading of the amount of tracer within the field of the instrument, which reading provides a relative indication of the amount of coating applied to the individual strand.

3,938,956

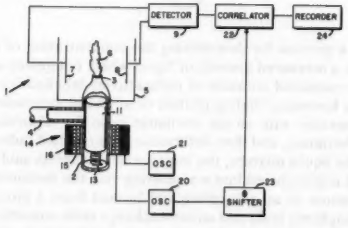
MODULATED HYDROGEN ION FLAME DETECTOR

John Dimeff, San Jose, Calif., assignor to The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed June 28, 1974, Ser. No. 484,209

Int. Cl.² G01N *27/62*

U.S. Cl. 23—254 EF 4 Claims



1. In a hydrogen flame detector having a means forming a chamber for receiving a mixture of a known gas and an unknown gas; a means forming a nozzle at one end of said chamber for providing a flame of said mixture of gases; and an electrode means for collecting ions of said unknown gas generated in said flame, the improvement comprising:

a means for modulating the density of said mixture of gases in said chamber at a predetermined frequency prior to their introduction into said flame, said modulation of said mixture serving to modulate said ions of said unknown gas at said predetermind frequency;

a means coupled to said electrode means for providing an output signal in response to said modulated ions having a component fluctuating at said predetermined frequency;

a means responsive to said modulating means for generating a reference signal having a component fluctuating at said predetermined frequency;

a means responsive to said output and said reference signals for providing a resultant signal corresponding to the cross-correlation between said first and said second output signal; and

a means coupled to said resultant signal generating means for utilizing said resultant signal.

3,938,957

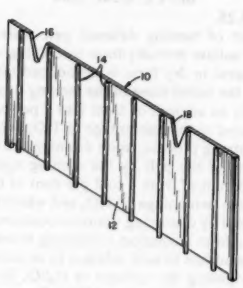
APPLICATOR CARD

Terry O. Lanier, Northboro, and Eugene F. Martha, North Attleboro, both of Mass., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,266

Int. Cl.² G01N *1/14, 31/20*

U.S. Cl. 23—259 5 Claims



1. A disposable applicator card comprising

an absorbent backing,

alignment means cooperatively associated with said backing, and

at least one compressible tube disposed on and affixed to one surface of said absorbent backing, each said tube extending beyond one edge of said backing.

3,938,958

FLUID DISPENSING DEVICE

Terry O. Lanier, Northboro, and Eugene F. Martha, North Attleboro, both of Mass., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,267

Int. Cl.² G01N *1/14, 31/20*

U.S. Cl. 23—259 16 Claims

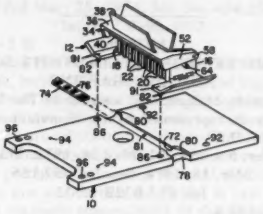
1. A fluid dispensing device comprising

a base plate,

support means operatively associated with said base plate suitable for operatively accommodating an applicator card having at least one compressible tube adhered to a backing, and

means operatively associated with said support means suit-

able for filling each said compressible tube with a quantity of test fluid and dispensing a predetermined quantity



of said test fluid from each said compressible tube to a test vehicle.

3,938,959

CATALYST-TYPE EXHAUST GAS PURIFYING DEVICE

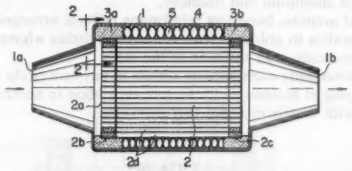
Kazuma Matsui, Toyota; Shigeo Hoshino, Kariya, and Sigeru Kamiya, Toyohaski, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 12, 1973, Ser. No. 406,107

Claims priority, application Japan, Oct. 20, 1972, 47-105651

Int. Cl.² B01J 8/00; F01N 3/15

U.S. Cl. 23—288 FC **3 Claims**



1. A catalyst-type exhaust gas purifying device comprising:

a housing having an exhaust gas inlet and an exhaust gas outlet at its opposite ends,

a monolithic catalyzing element disposed within said housing so as to define between the ends of the element an annular space between an outer peripheral surface of said catalyzing element and an inner peripheral surface of said housing, said catalyzing element including therein a plurality of elongated spaces extending parallel to a flow axis of said housing, and

a metal fabric in said annular space extending between said ends and short thereof, and supporting said catalyzing element,

both ends of those of said elongated spaces which are located at the outer circumferential part, including at least the outermost circumferential part, of said catalyzing element being filled with exhaust gas blocking material consisting of ceramic material, said blocking material extending into said elongated spaces at the outer circumferential part and sealing the ends thereof, said blocking material at each end of each said blocked elongated space being longitudinally spaced from the blocking material at the other end thereof, whereby said sealed elongated spaces at said outer circumferential part provide at least one annular layer of heat insulating spaces and the remainder part of said elongated spaces provide exhaust gas passages.

3,938,960

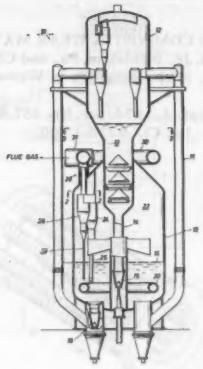
EXTERNAL FLUID CATALYTIC CRACKING UNIT REGENERATOR PLENUM MANIFOLD

Philip E. Glasgow, and Nathan Gilbert, both of Houston, Tex., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jan. 16, 1975, Ser. No. 541,680

Int. Cl.² B01J 8/18; B01D 45/12

U.S. Cl. 23—288 B **8 Claims**



1. For use in a regeneration chamber of upright circular construction in which a finely divided particulate catalyst is at least partly coated with a carbon material residue from its prior use as a catalyst is accumulated and the catalyst is found in a portion of the chamber in a dilute phase mixed with flue gases, the improvement comprising

at least two cyclone separator means in the regeneration chamber, each having an inlet means communicated with the regeneration chamber for receiving a mixture of flue gas and particulate catalyst thereinto and wherein said cyclone separator means separates the flue gas and catalyst which are discharged through separate outlet means;

an externally located flue gas plenum on the exterior of the regeneration chamber for said cyclone separator means for collecting flue gases therefrom and communicating the flue gas to a point of disposal; and

a generally vertically directed standpipe connected to each of said cyclone separator means and also connected to said plenum, said stand pipe passing through a wall of the regenerator chamber and which includes:

an internal metal pipe;

an insulation coating thereon; and,

hanger means connected to said pipe and extending therefrom and adopted to be connected at an exterior point to a fixed structural support.

3,938,961

SAMPLE TRAY

Terry O. Lanier, Northboro, Mass., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,265

Int. Cl.³ G01N 1/14, 31/20

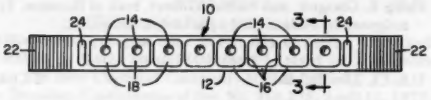
U.S. Cl. 23—292 **5 Claims**

1. A sample tray comprising

a base plate,

at least one elevated test specimen reservoir affixed to one surface of said base plate intermediate the ends thereof,

a catch basin surrounding each elevated test specimen reservoir, and



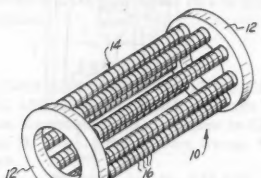
a wall surrounding each said catch basin so that each said catch basin is separated from each other catch basin.

3,938,962

LAMINATED COMPOSITE WEAR MATERIALS

Weston H. Feilbach, Jr., Bethlehem, Pa., and Charles S. Baum, St. Clair Shores, Mich., assignors to Weston H. Feilbach, Bethlehem, Pa.

Filed Apr. 4, 1974, Ser. No. 457,800
Int. Cl.² B32B *15/00*
U.S. Cl. 29—191 9 Claims



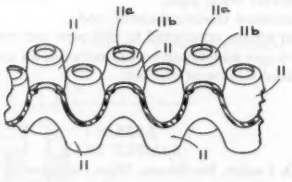
1. A composite body consisting of a plurality of metallic sections stacked and retained relative to one another so that a portion of the surface of each section abuts a portion of the surface of an adjourning section and another portion of the surface of each section forms a portion of the surface of said composite body, characterized by the process of treating, prior to assembly of said sections into said body, at least certain of the sections at said portions of their surfaces which abut an adjourning section so as to harden the surface of said sections.

3,938,963

SANDWICH CORE PANEL HAVING CURED FACE SHEETS AND A CORE FORMED WITH PROJECTING MODES

Jesse R. Hale, 25913 Stanford St., Hemet, Calif. 92343

Filed Oct. 1, 1973, Ser. No. 402,188
Int. Cl.² B32B *3/12, 3/28*
U.S. Cl. 29—191.4 7 Claims



1. A sandwich panel comprising:
first and second curved face sheets and
a core formed from projecting nodes sandwiched between said face sheets, said core nodes having end face portions, the end face portions of the nodes being excised at the central part thereof, the remaining portions of said node end face portions forming flanges which are bent away from the center plane of the core and the longitudinal axes of their respective nodes, said flanges being joined to the panel face sheets and conforming to the contour thereof.

3,938,964

BERYLLIUM REINFORCED COMPOSITE SOLID AND HOLLOW SHAFTING

Richard Schmidt, Mclean, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 256,491, May 24, 1972. This application Mar. 18, 1974, Ser. No. 452,156
Int. Cl.² B32B *15/02*
U.S. Cl. 29—191.4 6 Claims

1. A beryllium reinforced metal shaft comprising:
a plurality of arcuate, beryllium reinforcing ribbons imbedded in a metal matrix;
said metal matrix being selected from the group consisting of aluminum and titanium;
said arcuate, beryllium reinforcing ribbons arranged in said matrix to coincide with concentric circles whose centers coincide with the cent of the shaft,
substantially each arcuate ribbon in any one circle overlapping in arcuate width an arcuate ribbon in another circle with matrix material therebetween.

3,938,965

PROCESS FOR PRODUCING SOLID INDUSTRIAL FUEL

Owen Pyle, Anchorage, Ky., assignor to The Kingsford Company, Louisville, Ky.

Continuation-in-part of Ser. No. 275,366, July 26, 1972, and a continuation-in-part of Ser. No. 279,767, Aug. 11, 1972, which is a continuation-in-part of Ser. No. 271,795, July 14, 1972. This application Apr. 5, 1973, Ser. No. 347,993
Int. Cl.² C10L *9/08*
U.S. Cl. 44—1 C 7 Claims

1. A process for producing a substantially pollution-free fuel from moist woody vegetable materials comprising the steps of:
continuously supplying said materials to dryer; drying said materials until the moisture content thereof is less than approximately 15 percent; admitting said dried materials to a carbonizer; pyrolyzing said materials in said carbonizer to form crude charcoal and a fuel gas therefrom; collecting at least a major portion of the fuel gas and charcoal formed; cooling and conditioning said charcoal against spontaneous combustion; crushing said charcoal until it will pass through an approximately 16 mesh U.S. Standard sieve but no finer than will just pass through about an 80 mesh sieve; beneficating said crude charcoal in a classifier and removing a dense fraction having a bulk density of at least about 50 lbs. per cubic foot therefrom to form a beneficated fuel which will produce, when burned, low relatively nonabrasive ash.

5. The process of claim 1 further comprising the step of pulverizing said beneficated charcoal in a mill to produce a powdered fuel.

3,938,966

PROCESS FOR IMPROVING COAL

James K. Kindig, Arvada, and Ronald L Turner, Lakewood, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Filed Mar. 25, 1974, Ser. No. 454,253
Int. Cl.² C10L 9/02
U.S. Cl. 44—1 R 9 Claims

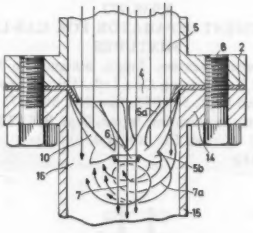
1. A process for beneficiating coal, including reducing sulfur and ash, increasing calorific value, and improving other properties, which comprises contacting a coal which contains impurities, such as pyrite or marcasite or other ash-forming minerals, which are substantially liberated from the coal particles, with an iron carbonyl under reaction conditions which substantially preclude the general thermal dissociation of the carbonyl into iron and carbon monoxide, in order to increase the apparent magnetic susceptibility of the impurities so that a magnetic separation between the coal and impurities may be effected.

3,938,967

DEVICE FOR POST-ATOMIZATION FOR COMBUSTION ENGINES USING A COMPRESSED MIXTURE AND AN EXTERNAL IGNITION

Anton Reissmüller, Failenschmidstrasse 28, D-7320 Goppingen-Jebenhausen, Germany

Filed Mar. 31, 1975, Ser. No. 563,635
Claims priority, application France, Mar. 29, 1974, 74.11406
Int. Cl.² B01F 3/02
U.S. Cl. 48—180 R 3 Claims



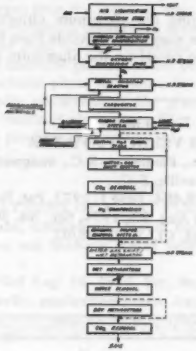
1. A device for post-atomization of fuel/air mixture delivered by a carburetor through an intake manifold to the cylinder of an internal combustion engine, said device including a flange mounted between the carburetor and the intake manifold, said flange forming a conical ring contiguous with the inner surface of the manifold throat, a plurality of fins attached at their outer ends to said conical ring and extending radially inward toward the center of the manifold throat, and in the downstream direction with respect to the flow of the fuel/air mixture, a circular nozzle at the center of the manifold throat and below said conical ring, said nozzle having a central opening, said fins at their inner ends being enlarged and curved to form blades that join said nozzle tangentially with respect to said opening, and said blades for the most part extending radially outward toward the wall of the intake manifold.

3,938,968

PROCESS FOR THE PRODUCTION OF SUBSTITUTE NATURAL GAS

Gerald A. White, Los Angeles, and Theodore R. Roszkowski, Malibu, both of Calif., assignors to The Ralph M. Parsons Company, Pasadena, Calif.

Continuation-in-part of Ser. No. 287,226, Sept. 8, 1972, abandoned. This application Sept. 6, 1974, Ser. No. 503,684
Int. Cl.² C01B 2/14
U.S. Cl. 48—215 13 Claims



1. A process for the production of substitute natural gas which comprises:

a. providing from the process a supply of high pressure steam;

b. using a portion of the high pressure steam to liquefy air and generate, from the liquefied air, gaseous oxygen;

c. introducing the gaseous oxygen, steam and a carbonaceous material to a partial oxidation reaction zone to form an initial gas stream containing predominately hydrogen and the oxides of carbon and minor amounts of methane;

d. passing at least a portion of the initial gas stream and steam through at least one wet methanation reaction zone where the gas stream and steam contact a low metal content wet methanation catalyst which comprises from about 5 to about 35% by weight of at least one metal from the third period of Group VIII of the Periodic Table on a temperature stabilized, ceramic alumina support, said support being heat treated at a temperature above the highest temperature encountered in said methanation zone prior to the addition of said metal thereto, at a temperature from about 900° to about 1600°F where the feed temperature to said wet methanation zone is at least about 900°F and the exit temperature from said methanation zone is up to about 1600°F to form methane followed by cooling of the gas stream exiting the wet methanation zone to produce high pressure process steam.

3,938,969

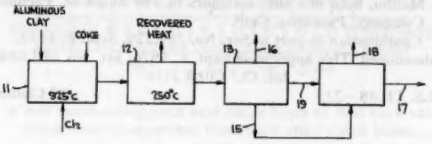
PURIFICATION OF ALUMINUM CHLORIDE

Roger Frank Sebenik, 4725 Chastant St., Metairie, La. 70002, and Alfred Lippman, 4613 Purdue Drive, Metairie, La. 70003, assignors to Toth Aluminum Corporation, New Orleans, La.

Filed Dec. 7, 1973, Ser. No. 422,846
Int. Cl.² B01D 47/00; C01F 7/48
U.S. Cl. 55—71 13 Claims

1. A method for recovering aluminum chloride from a mixed chloride gas containing aluminum chloride and at least

one chloride selected from the group consisting essentially of $FeCl_3$, $TiCl_4$ and $SiCl_4$ which comprises contacting said mixed chloride gas at atmospheric pressure with a liquid solvent in which aluminum chloride is soluble to dissolve the aluminum

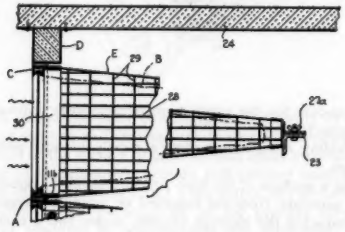


chloride, and recovering the aluminum chloride from the solvent by distilling the aluminum chloride from the solvent at a pressure sufficient to condense the aluminum chloride as a liquid.

3,938,970
HIGH VELOCITY FILTER

William E. Carter, Sr., Piedmont, S.C., assignor to Thermo-Kinetics, Inc., Greenville, S.C.

Division of Ser. No. 258,484, June 1, 1972, Pat. No. 3,844,749. This application Aug. 23, 1974, Ser. No. 500,119
Int. Cl.² B01D *46/02*
U.S. Cl. 55—276 **3 Claims**



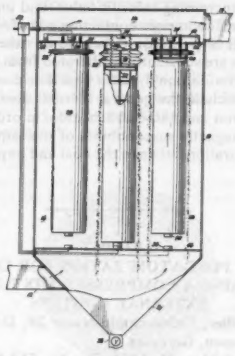
1. In a high velocity air handling assembly as for conditioning air in industrial plants, a filter and sound attenuator section comprising: a plurality of elongated longitudinally disposed sock filters having an open base on one end tapering inwardly therefrom toward and being closed on the other end; a plurality of elongated open ended boxes of substantially uniform cross-section constructed of sound absorbing material, each of said boxes containing one of said sock filters therein, said boxes extending substantially along the entire length of said sock filters; and support means carrying said boxes in longitudinal alignment with said filters in said air handling assembly, means holding the open end of said filters adjacent an open end of said boxes whereby said boxes straighten the air flow path through said air handling assembly and attenuate the sound passing therethrough.

3,938,971
BAG FILTER CLEANING DEVICE

Kenneth R. McClure, Andover, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,639
Int. Cl.² B01D *46/04*
U.S. Cl. 55—300 **1 Claim**

1. Apparatus for filtering solids from gas comprising a housing having an inlet compartment for dust bearing gas and an outlet compartment for clean gas, an apertured tube sheet intermediate said inlet and outlet compartments, an annular expansion joint attached to the tube sheet around each aperture thereof, a cylindrical support cage depending from each expansion joint, a fabric filter bag surrounding each support cage and attached to each annular expansion joint to intercept the dust particles in the dust bearing gas passing therethrough, cleaning means for said filter bags adapted to shake the filter bags to remove collected dust particles therefrom, said cleaning means comprising an electromagnet affixed to said housing at opposite ends of each filter bag, magnetic stop means aligned with each electromagnet and integral with the cage support, spring means attached at opposite ends to the mov-



able support cage and to the fixed housing structure, means for alternately energizing each electromagnet sufficient to axially flex the adjacent expansion joint to reciprocate the filter bag whereby said magnetic stop means abruptly terminates axial movement of each filter bag so as to agitate the dust particles whereby the dust particles may be dislodged from the filter and permitted to fall to the bottom of the filter house when the stop means strikes the electromagnet.

3,938,972
IMPINGEMENT SEPARATOR FOR GAS-LIQUID MIXTURES

Shojiro Sugimura, Tamano, Japan, assignor to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed Sept. 5, 1973, Ser. No. 394,471
Claims priority, application Japan, Sept. 8, 1972, 47-90125
Int. Cl.² B01D *45/08*
U.S. Cl. 55—440 **2 Claims**

1. A vertical flow impingement separator for gas-liquid mixtures comprising at least two separating elements spaced and held upright substantially in parallel to each other so as to provide therebetween a passage or passages for gas-liquid mixture, each of said separating elements having a first and a second outer plate bent in zigzag fashion to extend in a verti-

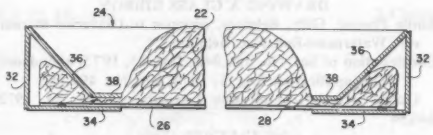
cal direction and spaced apart in a substantially parallel fashion except at upper and lower ends thereof, the second outer plate of one of said separating elements and the first outer plate of the other of said separating elements being so arranged to define therebetween a zigzag passage for the gas-liquid mixture, said first and second outer plates being provided with horizontal slits, each of which is disposed at a suitable position between an impingement position of the mixture upon the outer plates and a position at which the gas-liquid mixture is deflected at the next bent portion of the outer plate, so as to collect liquid which rushes out from the gas-liquid mixture due to inertial force directed out of the deflected stream of said mixture when said mixture flows along the separating elements in zigzag fashion, and a bent inner plate intervening between said first and second outer plates to form an independent series of liquid passages substantially separated from the passages for the gas-liquid mixture by the bent inner plate and either one of said first and second outer plates fixed to said bent inner plate, each of said liquid passages being communicated with one of said slits and said bent inner plate being provided a plurality of exits, each of which is located at a position corresponding to the bottom portion of each of the liquid passages to allow separated liquid to flow downward successively through said series of liquid passages whereby liquid separated from the gas-liquid mixture flows through said zigzag series of liquid passages without substantially being taken up or carried again by the gas-liquid mixture flowing through said zigzag passage, and is drained out at the lower end of the lowermost liquid passage.

3,938,973

AIR FILTER

Eli J. Kershaw, 6284 25th St., South, St. Petersburg, Fla. 33707

Filed Apr. 19, 1974, Ser. No. 462,575
Int. Cl.² B01D *46/10*
U.S. Cl. 55—501 **13 Claims**



1. An air filter, comprising:

a filter element of fibrous material; and

a frame for supporting said filter element at its marginal edges;

said frame comprising a strip of stiff paper scored along two spaced longitudinal lines and folded away from said longitudinal lines to form a trough for receiving said filter element, said strip also being folded transversely to form a closed configuration surrounding said filter element to receive said marginal edges of said filter element in said trough;

said frame including an outer wall, a flat rear wall extending inward from said outer wall, and a front wall extending inward from said outer wall toward said filter element and sloping toward said rear wall;

said front wall terminating in a flange disposed in a parallel relationship with said rear wall, said flange being secured to said rear wall with said filter element compressed therebetween to hold said frame and filter element together.

3,938,974

METHOD OF PRODUCING OPTICAL WAVE GUIDE FIBERS

Pedro B. Macedo, 6100 Highboro Drive, Bethesda, Md. 20034, and Theodore A. Litovitz, 904 Devere Drive, Silver Spring, Md. 20903

Continuation-in-part of Ser. No. 355,164, April 27, 1973, abandoned. This application Apr. 22, 1974, Ser. No. 462,481
Int. Cl.² C03C *17/02, 15/00;* G02B *5/14*
U.S. Cl. 65—3 R **29 Claims**

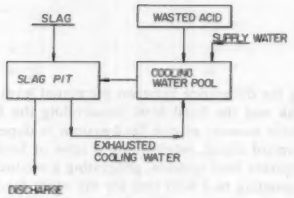
1. In a method for the production of an optical wave guide comprising a cladding layer and a glass core with an index of refraction larger than the index of refraction of said cladding layer, the improvement comprising forming said core by heat treating a base glass which is separable into at least a soluble phase and an insoluble phase to cause phase separation, leaching out the soluble phase and impurities to obtain an porous glass, thermally consolidating the glass to seal said pores, drawing the resultant glass into a fiber, and applying a cladding layer to produce said wave guide.

3,938,975

TREATMENT OF BLAST FURNACE SLAG

Takeshi Nagata, Kitakyushu, Japan, assignor to Nippon Steel Corporation and Hamada Heavy Industries Co., Ltd., both of, Japan

Filed Aug. 16, 1974, Ser. No. 498,023
Claims priority, application Japan, Aug. 27, 1973, 48-96864
Int. Cl.² C03B *1/00*
U.S. Cl. 65—19 **8 Claims**



1. A method for treating blast furnace slag containing sulfides comprising cooling and solidifying the slag discharged from the blast furnace by spraying an acidic aqueous solution containing not less than 0.003% ferrous sulfate or ferrous chloride onto the slag, said aqueous solution having a pH not less than 3.

3,938,976

PROCESSES AND APPARATUS FOR FEEDING MATERIAL TO A GLASS MELTING TANK

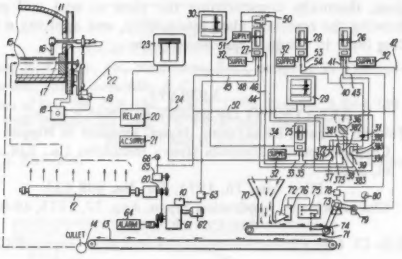
Norman Issac Webb Walker, Liverpool, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Dec. 27, 1973, Ser. No. 429,019
Claims priority, application United Kingdom, Dec. 28, 1972, 59836/72
Int. Cl.² C03B *3/00*
U.S. Cl. 65—29 **12 Claims**

1. Apparatus for feeding material to a glass melting tank comprising, a first feed means for feeding solid batch material to the tank at an adjustable and controlled rate, a second feed means for feeding cullet to the tank at an adjustable and controlled rate, a first control means for controlling the rate of feed of the solid batch material in said first feed means, a second control means for controlling the rate of feed of cullet in said second feed means, a glass level detector for detecting the level of glass within the tank and generating a first control signal indicative of said level, one of said control means being arranged to receive said first control signal and thereby control the feed rate of the associated feed means in dependence on the level detected, and an adjustable ratio control unit

arranged to receive a signal dependent on the rate of feed of said associated feed means and provide a second control signal to the other of said control means such that the first and second control signals correspond and maintain a predetermined ratio of feed rates for the two feed systems.

10. A method of controlling feeding rates of batch material and cullet which are fed by two separate feed systems to a glass melting tank, comprising the steps of establishing a fixed reference level of glass within the tank, detecting the level of glass within the tank, generating a first control signal representing the difference between the actual level of glass within the tank and the fixed level, controlling the feed rate in an adjustable manner of one feed system in dependence on the first control signal, establishing a ratio of feeds between the two separate feed systems, generating a second control signal corresponding to a feed rate for the other feed system which is a function of the established ratio of the feed rate of the said one system, and supplying said second control signal to a control device for controlling the rate of feed in an adjustable manner said other feed system.



3,938,977

PROCESS FOR PRODUCING PHOTOCHROMICITY IN UNTREATED GLASSES OF SUITABLE COMPOSITION BY A TEMPERATURE TREATMENT IN A LIQUID

Georg Gliemeroth, Mainz-Mombach, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed June 19, 1973, Ser. No. 371,546

Claims priority, application Germany, June 22, 1972, 2230506

Int. Cl.[2] C03B *25/00*; C03C *21/00*

U.S. Cl. 65—30 R 8 Claims

1. In a process for thermally activating a photochromically inactive untreated glass composition containing sufficient silver halide for obtaining photochromically active glass, said silver halide being substantially uniformly distributed therein, the improvement which comprises immersing said glass for a sufficient time in a substantially silver-free molten salt bath having a sufficiently high annealing temperature to photochromically activate said glass, wherein the density of the molten salt is substantially the same as or somewhat lower than the density of the glass so that deformation of said glass during the annealing is essentially prevented, said process of photochromic activation in said molten salt bath being conducted in the substantial absence of ion exchange for the purpose of chemically strengthening or tinting the glass.

3,938,978

METHOD OF MAKING CRYSTALLIZED GLASS

Merritt J. Hummel, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 343,981, March 22, 1973, Pat. No. 3,856,497, which is a continuation-in-part of Ser. No. 239,335, March 29, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,415. The portion of the term of this patent subsequent to Dec. 24, 1991, has been disclaimed.

Int. Cl.[2] C03B *29/00*

U.S. Cl. 65—33 6 Claims

1. A method of making a crystallized glass article substantially free of microcracking, comprising:

a. preparing a glass batch consisting essentially of

i. a silica,

ii. an alumina,

iii. a lithium family glass batch ingredient consisting of a lithium salt, and

iv. a zinc salt in an amount sufficient to provide a crystallized glass article from said glass batch having a ZnO content, percent by weight on an oxide basis of 1 to 4.0, which crystallized glass article obtained is characterized by the presence of microcracks in the surface thereof

b. adding to said glass batch an alkali metal salt wherein the alkali metal is a member of the group consisting of potassium, rubidium and cesium, said alkali metal salt being present in an amount sufficient to provide a glass article upon cooling a melt of said glass batch having a content of an oxide of the alkali metal of said salt, percent by weight on an oxide basis of 0.15 to 2.50,

c. melting the glass batch containing the ingredients set forth in (a) and (b) to form a glass melt,

d. cooling said glass melt and subsequently therewith,

e. forming a glass article,

f. heat treating said glass article at a temperature and for a time sufficient to form crystals throughout the glass article and to form a crystallized glass article having surfaces thereof substantially free of microcracks.

3,938,979

METHOD AND APPARATUS FOR VERTICALLY DRAWING A GLASS RIBBON

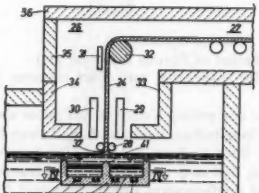
Emile Plumat, Gilly, Belgium, assignor to Glaverbel-Mecaniver, Watermael-Boitsfort, Belgium

Continuation of Ser. No. 326,043, Jan. 23, 1973, abandoned. This application Aug. 1, 1974, Ser. No. 493,888

Claims priority, application Luxemburg, Jan. 24, 1972, 64654

Int. Cl.[2] C03B *15/04*

U.S. Cl. 65—90 17 Claims



1. In a process of manufacturing flat glass by drawing glass upwardly as a continuous ribbon from a bath of molten glass held in a drawing kiln via a drawing meniscus located at the surface of such bath in the drawing zone of the kiln, into which zone forward and reverse currents of glass, originating from a main current of molten glass which flows into such zone from a region to which glass is continuously supplied, flow in re-

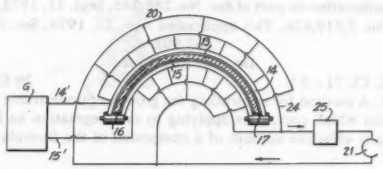
spectively opposite directions along such surface toward the meniscus, the improvement comprising the steps of: maintaining completely immersed in the bath, beneath at least part of the drawing zone and spaced above the bottom of the bath, at least one pool of molten material; providing heat exchange means outside the pool; and withdrawing heat from such pool by effecting a heat exchange between the pool and the means, for maintaining a predetermined temperature profile in such part of the drawing zone, said step of withdrawing heat being carried out to withdraw heat to a greater extent at a region of the bath located at a central portion of the length of the drawing zone than at a region located at an end portion of the length of the drawing zone in a manner to reduce the temperature gradient in the bath along the line between such central and end portions.

8. In apparatus for manufacturing flat glass by drawing, including a feed channel along which molten glass is continuously fed from one end thereof and means for drawing glass upwardly as a continuous ribbon from the surface of the molten glass in such channel at a drawing zone disposed between the one end and a remote end of the channel, whereby molten glass fed from the channel flows along such surface in respectively opposite directions into the ribbon via a drawing meniscus, the improvement comprising at least one refractory member located in said channel and holding at least one pool of molten material completely immersed in the molten glass in such channel, beneath said drawing zone, said refractory member being shaped to withdraw heat from the glass to a greater extent at a central portion of the length of the drawing zone than at the end portions of the length of the drawing zone in a manner to reduce the temperature gradient in the bath along the line between such central portion and such end portions.

3,938,980
METHOD AND APPARATUS FOR FORMING TEMPERED GLASS ARTICLES

Walter K. French, Montrose, N.Y., assignor to The Seagrave Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 426,526, Dec. 20, 1973, Pat. No. 3,875,766. This application Oct. 15, 1974, Ser. No. 514,422
Int. Cl.² C03B 27/00
U.S. Cl. 65—114 **2 Claims**



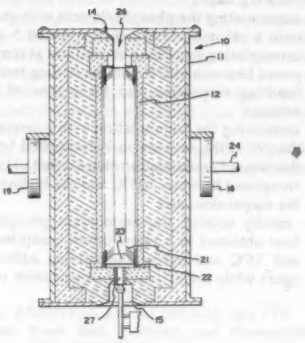
1. The method of tempering an elongated glass article having a regular, non-planar cross section defining interior and exterior main surfaces and having adjacent edge portions, without significant deformation thereof, comprising the steps of supporting the weight of said article on said edge portions, subjecting at least transverse increments of said article to a source of homogeneous heat while simultaneously quenching said surfaces while the article is supported on said edge portions to define within said article a temperature differential condition in which interior portions of said article are at temperatures at least as high as the annealing temperature of said glass, while said surfaces of said glass are at a temperature sufficiently below said annealing temperature to remain rigid and, hence, susceptible of supporting the weight of said article without deformation under gravitational influences.

2. Apparatus for the tempering of a glass article comprising support means for said article, a pair of homogeneous heater means in proximate spaced relation to said surfaces of said article for adding heat to said article at an essentially constant rate throughout the thickness of said article, quench means extending through said heater means, said quench means including apertures adjacent said surfaces, and means for conducting quench fluids through said apertures and against said surfaces, and suction means for drawing off said quenching fluids after the same have been directed against said surfaces, said quench means acting on said article while the same is subject to the influences of said homogeneous heater means for preferentially extracting heat from the surfaces of said article, thereby to establish in said article a condition in which interior portions of said article are at temperatures approximating or exceeding the annealing temperature of said article while said surfaces are at temperatures substantially below the annealing temperature.

3,938,981
METHOD FOR REMOVING GASEOUS INCLUSIONS FROM MOLTEN GLASS

Douglas F. St. John, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 29, 1974, Ser. No. 518,362
Int. Cl.² C03B 5/14
U.S. Cl. 65—134 **3 Claims**



1. The method of refining molten glass which comprises:

a. defining a chamber having an axis of rotation and having a restricted top and bottom forming a top opening and a bottom discharge respectively;

b. introducing a stream of molten glass into said chamber, said stream of molten glass having substantially all glass-making constituents in a molten state and containing undesirable entrapped gaseous inclusion;

c. continuing to introduce molten glass so as to provide a mass of molten glass in the chamber;

d. rotating said chamber about its axis and thereby rotating the enclosed mass of molten glass so as to subject at least portions of the mass of glass in the chamber to centrifugal forces;

e. controlling the speed of the rotation of the chamber and the amount of glass in the chamber such that a paraboloidal void is formed in the mass of glass;

f. diverting substantially all of the downwardly flowing molten glass into a plurality of confined downwardly and outwardly directed flow paths;

g. each path defining a velocity profile in which the velocity of portions of the downwardly diverted flowing molten glass is decreased thereby;

h. causing the gaseous inclusions to travel against the direction of the downwardly and outwardly flowing molten glass, inwardly and upwardly in the confined flow paths and into the void;

i. maintaining the volume of the mass of glass in the chamber substantially constant; and

j. removing refined molten glass from the discharge of the chamber.

3,938,982

PROCESS FOR PREPARING LIQUID FERTILIZERS

Alessandro Frangioni, Mogliano Veneto (Treviso); Giovanni Venturino; Giorgio Morandi, both of Mestre (Venice), and Adriano Del Vesco, Mantova, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed July 27, 1973, Ser. No. 383,113

Claims priority, application Italy, July 28, 1972, 27589/72

Int. Cl.² C05B 7/00; C01B 25/26

U.S. Cl. 71—34 8 Claims

1. A continuous process for the preparation of suspension liquid fertilizers starting from ammonia and phosphoric acid having a P_2O_5 concentration not higher than 36% by weight obtained by the wet method, and which fertilizers contain ammonium phosphate in suspension, said process comprising the following steps:

1. ammoniating the phosphoric acid with gaseous ammonia until a pH comprised between 4 and 5 is attained, said ammoniating step being carried out at temperatures comprised between 105°C and the boiling temperature of the resulting suspension and for a time of from 30 to 90 minutes;
2. continuing the ammoniation with gaseous ammonia until the pH of the suspension is comprised between 6 and 8, this second ammoniation step carried out at temperatures comprised between 105°C and the boiling temperature of the suspension; and
3. rapidly cooling the ammonium phosphate suspension thus obtained to a temperature comprised between 0°C and 35°C and during the cooling adding a suspending agent while maintaining the suspension under stirring.

3,938,983

COMPOSITION CONTAINING AN ALIPHATIC N-CYCLOALKYL-P-(2-CHLOROETHYL)-PHOSPHONAMIDATE

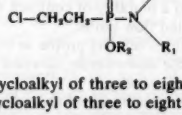
David I. Randall, and Robert W. Wynn, both of Easton, Pa., assignors to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 230,455, Feb. 29, 1972, abandoned, which is a division of Ser. No. 875,498, Nov. 10, 1969, abandoned. This application Feb. 12, 1974, Ser. No. 441,860

Int. Cl.² A01N 9/36

U.S. Cl. 71—86 5 Claims

1. The method for stimulating plant growth which comprises contacting the plants to be treated with an effective amount of a substituted 2-chloroethyl phosphonamidic ester of the following formula:



wherein R is cycloalkyl of three to eight carbon atoms, R_1 is hydrogen or cycloalkyl of three to eight carbon atoms and R_2 is alkyl of one to seven carbon atoms or haloalkyl wherein alkyl contains one to seven carbon atoms, as active ingredient, in admixture with a suitable plant growth regulating carrier.

3,938,984

HERBICIDE

Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 348,085, April 4, 1973. This application May 23, 1974, Ser. No. 472,654

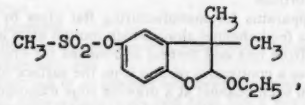
Claims priority, application Germany, Apr. 13, 1972, 2217698

Int. Cl.² A01N 9/28

U.S. Cl. 71—88 8 Claims

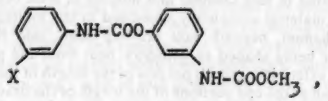
1. A herbicide composition containing a herbicidally effective amount of a mixture consisting essentially of

a. a compound of the formula



and

b. a compound of the formula



where X denotes hydrogen or lower alkyl of a maximum of 3 carbon atoms in a weight ratio of *a* to *b* in the range of 9:1 to 1:9.

3,938,985

SUBSTITUTED TRIAZINES

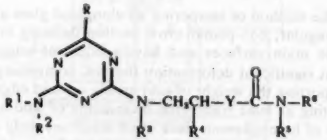
John W. Kobzina, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 288,245, Sept. 11, 1972, Pat. No. 3,819,626. This application Apr. 22, 1974, Ser. No. 462,905

Int. Cl.² A01N 9/22

U.S. Cl. 71—93 20 Claims

1. A method for controlling the growth of undesirable vegetation which comprises applying to said vegetation an herbicidally effective amount of a compound of the formula



wherein R is chlorine, methoxy or methylthio; R^1 is alkyl of from 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, or alkoxyalkyl of 2 to 6 carbon atoms; R^2, R^3, R^4 and R^5 are hydrogen or alkyl of 1 to 6 carbon atoms; R^6 is alkyl of 1 to 6 carbon atoms, monocarbocyclic aryl of 6 to 10 carbon atoms substituted with up to 3 (0 to 3) fluorine, chlorine or bromine atoms; and Y is oxygen or sulfur.

3,938,986

HERBICIDE

Blaine O. Pray, Ponce, P.R., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 807,934, March 17, 1969, abandoned, which is a continuation-in-part of Ser. No. 580,891, Sept. 21, 1966, abandoned, and a continuation-in-part of Ser. No. 599,699, Dec. 7, 1966, abandoned, and a continuation-in-part of Ser. No. 631,593, April 18, 1967, abandoned. This application July 28, 1970, Ser. No. 59,004

Int. Cl.² A01N *9/20*

U.S. Cl. 111—111 7 Claims

1. A herbicidal composition containing as a herbicidal component isopropyl N-(3-chlorophenyl)carbamate in an amount sufficient to be herbicidally effective when applied to the soil, and further containing an amount of 4-chlorophenyl N-methylcarbamate sufficient to extend the soil life of said isopropyl N-(3-chlorophenyl)carbamate.

3,938,987

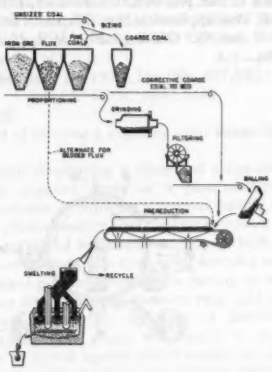
PROCESS FOR PREPARING A SMELTER FURNACE CHARGE COMPOSITION

Thomas E. Ban, South Euclid, Ohio, assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 353,594, April 23, 1973, abandoned. This application Apr. 11, 1974, Ser. No. 460,125

Int. Cl.² C22B *1/16*; C21C *5/52*

U.S. Cl. 75—3 5 Claims



1. A process for the preparation of a complete self-reducing charge composition including prereduced metal pellets having a crushing strength of from about 40 to about 150 pounds comprising the step of prereducing on a traveling grate:

a. green pellets comprising iron oxide, water, and a nonagglomerating carbonaceous material without any additional binder for binding the pellet during and after prereduction said nonagglomerating carbonaceous material supplying an amount of fixed carbon which is insufficient to reduce 100% of the iron oxide to metallic iron and is in the range of from 40% to 80% of that required to:

1. carburize the iron so produced; and

2. reduce all the iron oxide constituents to the metallic state;

b. external corrective coarse carbonaceous material in an amount sufficient to supply the balance of the required amount of fixed carbon to:

1. carburize the iron so produced; and

2. reduce all the iron oxide constituents to the metallic state,

said prereducing being at a temperature of at least 1800° F to reduce at least a portion of the iron oxide to metallic iron, and said external carbonaceous material being physically blended with said green pellets.

3,938,988

METHOD FOR PRODUCING ALUMINUM METAL FROM ITS SALTS

Donald F. Othmer, 333 Jay St., Brooklyn, N.Y. 11201

Continuation of Ser. Nos. 103,765, Jan. 4, 1971, Pat. No. 3,793,003, and Ser. No. 308,059, Nov. 20, 1972, Pat. No. 3,853,541, and Ser. No. 370,310, June 15, 1973, Pat. No. 3,861,904. This application Aug. 7, 1973, Ser. No. 386,411

Int. Cl.² C22B *4/00*

U.S. Cl. 75—10 R 20 Claims

1. The process of producing aluminum from a salt containing aluminum and a single other element by steps comprising:

a. heating said salt to a high temperature of at least 2500°–5500°C to break it into aluminum and said other element in a mixture comprising the two elemental gases;

b. flash cooling said mixture comprising said two elemental gases from said high temperature, to a lower temperature of not over 1500°C within a time interval of not more than one to five seconds, by contacting said gas mixture directly with a coolant which is liquid at said lower temperature and is chemically nonreactive with said salt and its constituent elements in elemental form at said lower temperature; and

c. condensing said aluminum in said liquid coolant while allowing said other element to pass on in a gas phase.

3,938,989

ARSENIC REMOVAL FROM NICKEL MATTE

Malcolm Charles Evert Bell, Sudbury, and Ramamritham Sridhar, Mississauga, both of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed June 24, 1974, Ser. No. 482,250

Claims priority, application Canada, July 5, 1973, 175759

Int. Cl.² C22B *23/00*

U.S. Cl. 75—82 20 Claims

1. A process for refining nickel matte which comprises establishing a molten bath of nickel matte containing at least one impurity selected from the group consisting of antimony, arsenic, bismuth, selenium, and tellurium and at least about 28% sulfur and contacting the nickel matte with gaseous chlorine which reacts with the impurity to form a chloride that is volatilized from the nickel matte, thereby separating said impurity from the matte.

3,938,990

METHOD OF MAKING CORROSION RESISTANT AUSTENITIC STEEL

Albert G. Hartline, III, Tarentum, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

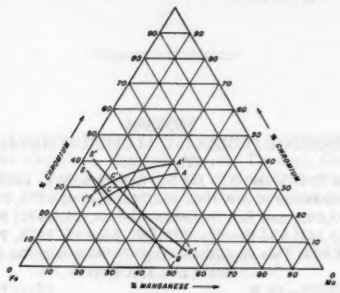
Division of Ser. No. 419,576, Nov. 28, 1973, Pat. No. 3,880,654. This application Sept. 5, 1974, Ser. No. 503,224

Int. Cl.² C22C *38/58*

U.S. Cl. 75—122 1 Claim

1. A method for producing a substantially nonporous austenitic stainless steel which comprises compositing an alloy

consisting essentially of about 21–45% manganese, about 10–30% chromium, about 1–4% nickel, about 0.85–3% nitrogen, up to 1% carbon, up to 2% silicon, and the balance iron and residuals, wherein the composition is such that:



$$1.\ \%Cr + 0.8(\%Mn) - 11.8(\%N - 0.1) - 1.23(\%Ni) = 28.5$$

$$(2)\quad \frac{30\,(\%C + \%N) + 0.5\,(\%Mn) + \%Ni}{\%Cr + 1.5\,(\%Si)} = 1.5$$

melting said materials to form a homogeneous liquid phase and solidifying the resultant liquid phase by air cooling or quenching in the temperature range from about 1000°–1600°F.

3,938,991

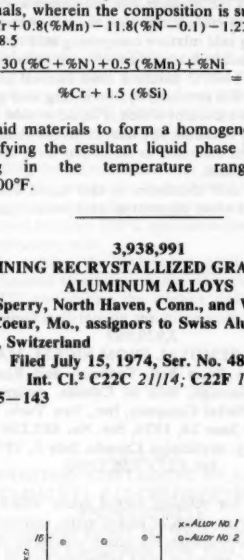
REFINING RECRYSTALLIZED GRAIN SIZE IN ALUMINUM ALLOYS

Philip R. Sperry, North Haven, Conn., and William C. Setzer, Creve Coeur, Mo., assignors to Swiss Aluminium Limited, Chippis, Switzerland

Filed July 15, 1974, Ser. No. 488,677

Int. Cl.² C22C *21/14*; C22F *1/04*

U.S. Cl. 75—143 **18 Claims**



1. An aluminum base alloy possessing a fine recrystallized grain size in the annealed condition which consists of 0.03 – 0.6% silicon, 0.03 – 0.7% iron, 0.03 – 1.5% manganese, 0.03 – 0.20% vanadium, up to 0.3% copper, up to 0.2% titanium, balance aluminum.

3,938,992

ELECTROGRAPHIC DEVELOPING COMPOSITION AND PROCESS USING A FUSIBLE, CROSSLINKED BINDER POLYMER

Thomas A. Jadwin; Ravi Khanna; Stewart H. Merrill, and Edmond S. Perry, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 380,317, July 18, 1973, abandoned. This application Aug. 19, 1974, Ser. No. 498,818

Int. Cl.² G03G *9/00*, *5/00*

U.S. Cl. 96—1 SD **17 Claims**

1. An electrographic developing composition comprising a mixture of finely-divided carrier particles and finely-divided crosslinked toner particles electrostatically attractable thereto, said toner particles having an average particle size within the range of about 0.01 to about 100 microns and comprising a fusible binder polymer, the molecular chains of said polymer being covalently crosslinked to an extent sufficient to extend the useful fusing range of said toner particles by at least about 10°C. relative to comparable uncrosslinked toner particles comprising the same binder polymer except in uncrosslinked form.

3,938,993

XEROGRAPHIC METHOD FOR MAKING A RESPONSIVE ANSWER SYSTEM

Stephen F. Royka, Fairport, and Robert G. Martin, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 648,701, June 26, 1967, Pat. No. 3,877,155. This application Nov. 27, 1973, Ser. No. 428,979

Int. Cl.² G03G *13/20*, *13/22*, *15/20*

U.S. Cl. 96—1.4 **6 Claims**

1. A xerographic method for making a device for selectively indicating information characterized by having simultaneously legible meaningful permanent information and legible confusing removable information displayed on a surface within a response area, said method comprising the steps of:

a. printing said legible meaningful permanent information on said surface within said response area; and

b. xerographically printing said legible confusing removable information on said surface within said response area by forming a latent electrostatic image, corresponding to said legible confusing removable information, on a xerographic plate, developing said latent image with toner, transferring at least part of said toner image to said surface, and fixing said toner image to said surface, said fixing being to a greater than class 1 but less than class 3 fix.

3,938,994

PYRYLIUM DYES FOR ELECTROPHOTOGRAPHIC COMPOSITION AND ELEMENT

George A. Reynolds; James A. Van Allan, and Lawrence E. Contois, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 235,845, March 17, 1972. This application June 18, 1974, Ser. No. 480,331

Int. Cl.[2] G03G *5/06*

U.S. Cl. 96—1.6 8 Claims

1. A photoconductive composition comprising an organic photoconductive electrically insulating material containing a sensitizing amount of a compound selected from the group consisting of:

1. 2,4-Diphenyl-6-(2,6-diphenyl-4H-pyran-4-ylidenemethyl)-pyrylium salts
2. 2,6-Diphenyl-4-(2,6-diphenyl-4H-pyran-4-ylidenemethyl)-pyrylium salts
3. 4-(Benzoyl-2,6-diphenyl-4H-pyran-4-ylidenemethyl)2,6-diphenyl-pyrylium salts and
4. 2,6-Bis(4-amyloxyphenyl)-4-[2-(4-amyloxyphenyl)-6-phenyl-4H-pyran-4-ylidenemethyl]pyrylium salts,

said composition exhibiting photoconductive sensitivity to visible light in that portion of the spectrum extending from about 570 to about 620 millimicrons.

3,938,995

SILVER HALIDE COLOR PHOTOGRAPHIC ELEMENT AND PROCESS CONTAINING LEUCO DYES

Thomas Edward Gompf, Penfield, and William Henry Faul, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 10, 1974, Ser. No. 487,083

Int. Cl.[2] G03C *7/00*, *1/40*

U.S. Cl. 96—55 16 Claims

5. A method of forming a negative color image which comprises:

1. concurrently developing a silver and a dye image in the imagewise exposed areas of a photosensitive photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer containing a stabilized ballasted leuco dye which comprises the reaction product of a cyan color-forming coupler and a N,N-dialkyl-p-phenylenediamine having an electronegative group attached to the benzene ring, said electronegative group having the capability of deactivating the p-phenylenediamine group sufficiently to stabilize the leuco dye molecule against aerial oxidation; and
2. removing developed silver and residual silver halide to leave a cyan dye image in the imagewise exposed areas of said layer without oxidizing the leuco dye molecules in the non-exposed areas of said layer.

3,938,996

PROCESS FOR DEVELOPING LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Mitsuto Fujiwhara; Ryosuke Satoh; Toyoaki Masukawa, and Takahiro Uozumi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co. Ltd., Tokyo, Japan

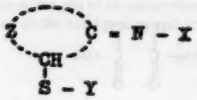
Filed June 17, 1974, Ser. No. 479,895

Claims priority, application Japan, June 22, 1973, 48-69867

Int. Cl.[2] G03C *5/30*, *7/00*

U.S. Cl. 96—66.3 12 Claims

1. A process for developing an imagewise exposed, light-sensitive silver halide photographic material which comprises developing the photographic material in the presence of a compound having the general formula:



wherein Z is an atomic grouping necessary to form a 5, 6 or 7 membered carbocyclic ring; Y is a group which, when the sulfur atom of the thioether linkage is released, forms together with said sulfur atom a compound having a development-inhibiting action; and X is a hydroxyl group or a substituted or nonsubstituted amino group.

3,938,997

RAPID ACCESS, AIR STABLE, REGENERABLE IRON CHELATE DEVELOPER SOLUTIONS

Richard S. Fisch, and Norman Newman, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1975, Ser. No. 563,064

Int. Cl.[2] G03C *5/30*, *5/26*

U.S. Cl. 96—66.3 5 Claims

1. A superadditive non-fixing developer solution comprising at least three developer materials, the solution comprising an iron chelating developer, a second developer selected from the group consisting of ascorbic acid, sugartype derivatives of ascorbic acid, and stereoisomers and diastereoisomers of ascorbic acid and its sugar-type derivatives, and a third developer selected from the group consisting of 1-phenyl-3-pyrazolidone, glycin, cysteine hydrochloride, hydroxylamine sulfate, 4-amino-N-ethyl-N-(β-methanesulfoneamidoethyl)-m-toluidine, and hydroquinone monosulfonate.

3,938,998

LOW CONTRAST, RAPID ACCESS, AIR STABLE, REGENERABLE IRON CHELATE DEVELOPER SOLUTIONS

Richard S. Fisch, and Norman Newman, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1975, Ser. No. 563,087

Int. Cl.[2] G03C *5/30*, *5/26*

U.S. Cl. 96—66.3 3 Claims

1. A rapid access, low contrast air stable non-fixing developer solution which comprises an iron chelate photographic developer and at least one second developer selected from the group consisting of amidol, gallic acid, tannic acid and 2,5, di-tert-butyl hydroquinone.

3,938,999

ANTISTATIC PHOTOGRAPHIC SENSITIVE MATERIALS

Masakazu Yoneyama; Nobuo Yamamoto; Naohiko Sugimoto; Ikutaro Horie, all of Minami-ashigara, and Yasuhiro Nakayama, Fujimiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

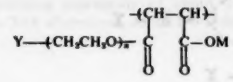
Filed Mar. 31, 1975, Ser. No. 563,904

Claims priority, application Japan, Mar. 30, 1974, 49-36410

Int. Cl.[2] G03C *1/84*, *1/82*

U.S. Cl. 96—84 R 12 Claims

1. An antistatic photographic sensitive material comprising a support having thereon at least one silver halide emulsion layer, wherein a surface active copolymer containing in the main chain an alkyl repeating unit represented by the formula (I)



(I)

wherein Y represents an organic residue having 4 to 22 carbon atoms; n represents the average number of ethyleneoxy units and is 1 to 100; and M represents a hydrogen atom, an alkali metal atom, an alkaline earth metal atom, an ammonium group or an alkylammonium group is present in at least one of a surface of the support and a photographic layer.

3,939,000

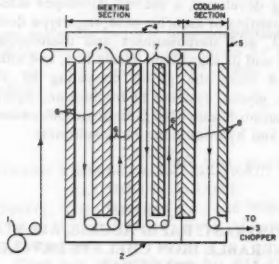
FLAT PHOTOGRAPHIC FILM PRODUCED BY HEATING ABOVE THE SECOND ORDER TRANSITION TEMPERATURE OF THE BASE

Harold C. Arvidson, Jr., Princeton Junction, N.J., and Quayton Ray Stottlemyer, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 21, 1973, Ser. No. 417,803

Int. Cl.² G03C *1/80*; B29C *25/00*

U.S. Cl. 96—87 R **8 Claims**



1. A process for removing curl from a biaxially oriented polyester film coated with at least one photosensitive layer comprising briefly raising the temperature of the film to a temperature which is above its second order transition temperature but not in excess of 120°C.

3,939,001

SPOONABLE FROZEN GELATIN DESSERT CONCENTRATE

Adolph Scott Clausi, Cos Cob, Conn.; Martin Glicksman, Valley Cottages, and Elizabeth Farkas, Yonkers, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 368,150, June 8, 1973, Pat. No. 3,889,002. This application Aug. 1, 1974, Ser. No. 493,574

Int. Cl.² C09H *11/00*

U.S. Cl. 106—136 **5 Claims**

1. A method of making a hydrophilic colloid readily dispersible and soluble in hot tap water which comprises soaking the hydrophilic colloid in a polyhydric alcohol not exceeding ambient temperatures for at least about one hour such that the hydrophillic colloid appears as discrete swollen particles impregnated with the polyhydric alcohol but prior to actual dissolution in the alcohol.

3,939,002

METHOD OF MAKING A CERAMIC FIBER REPLICA OF A BODY OF RETICULATED ORGANIC FOAM

Colin Washbourne, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed Oct. 23, 1974, Ser. No. 517,253

Claims priority, application United Kingdom, Nov. 12, 1973, 52449/73

Int. Cl.² C04B *35/80*, *35/84*

U.S. Cl. 106—41 **6 Claims**

1. A ceramic replica of a body of reticulated organic foam wherein the ceramic consists wholly or substantially of fibrous material, the average fiber length of the fibrous material being at most 50% of the diameter of the cells of the foam, and any non-fibrous particulate matter present making no significant contribution to the strength of the replica body.

4. A method of making a ceramic replica, consisting wholly or substantially of fibrous material, of a body of reticulated organic foam comprising the steps of

impregnating a body of reticulated organic foam with a slurry of finely-divided inorganic fibers, the average fiber length of the fibrous material being at most 50% of the diameter of the cells of the foam, and any non-fibrous particulate matter present making no significant contribution to the strength of the body,

drying the so-impregnated body, and

firing the so-impregnated and dried body at a temperature of at least 500°C.

3,939,003

FABRICATION OF METAL-CERAMIC COMPOSITES

James W. McCauley, Wakefield; Dennis J. Viechnicki, Wellesley, and Frederick Schmid, Marblehead, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 287,165, Sept. 7, 1972. This application Feb. 15, 1974, Ser. No. 443,061

Int. Cl.² C04B *35/02*

U.S. Cl. 106—65 **7 Claims**

1. A constrained single crystal metal ceramic grown from seed in a crucible and having the orientation of the seed, said crystal having incorporated therein a metallic net, the metallic net having been positioned so that on the unidirectional solidification of the ceramic material, the crystal grew through the metallic net.

3,939,004

ASPHALT PAVING COMPOSITIONS FROM POSITIVE SPOT ASPHALT FRACTIONS

Luke W. Corbett, Mountainside, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 222,693, Feb. 1, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,440

Int. Cl.² C08L *95/00*; C10C *3/08*

U.S. Cl. 106—273 R **4 Claims**

1. An asphalt composition suitable for use in a paving formulation, which comprises a mixture of

a. an asphaltene fraction having substantially no petrolene content,

b. propane-precipitated asphalt having a softening point of 150° to 225°F., a penetration at 77°F. of 0 to 15 dmm, and polar aromatic content of at least 20 percent by weight, and

c. vacuum gas oil having an atmospheric equivalent boiling range within the limits of about 650°F. and 1150°F.

said composition having a polar aromatic content of at least 30 percent by weight, a ductility (ASTM D-113) of at least 50 cm, and a 39.2°F. penetration ratio of at least about 0.25, said composition having a negative Oliensis Spot Test,

said asphaltene fraction constituting about 5 to 45 wt. % of the composition, and said vacuum gas oil constituting no more than 10 wt. % of the composition.

3,939,005

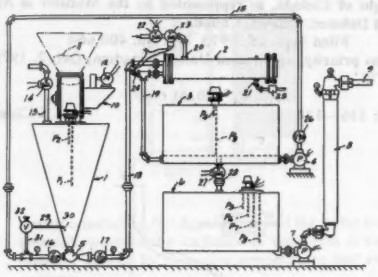
METHOD FOR AUTOMATIC PREPARATION OF SOLUTIONS OF LIQUID AND DRY MATERIALS

Donald R. White, 5218 Howard, Western Springs, Ill. 60558

Division of Ser. No. 339,420, March 8, 1973. This application July 5, 1974, Ser. No. 486,017

Int. Cl.[2] B01F *1/00*

U.S. Cl. 127—63 5 Claims



1. A method for the automatic preparation, on demand, of a liquid material from dry and/or liquid component materials, comprising the steps of providing a predetermined quantity, of fixed total amount, of a first component material, adding a predetermined quantity, of fixed total amount, of a second component material to said first quantity, at least one of said component materials being in liquid form, to form a mixture of fixed total amount having a predetermined concentration, providing a previously prepared supply of such liquid material, circulating such previously prepared material through a closed path, not including said fixed total amount of said mixture of predetermined concentration, withdrawing quantities of said mixture from said fixed total amount, in amounts that are small as compared with said total amount, and introducing said small amounts of mixture so withdrawn into said closed circulating path, and applying sufficient heat to the prepared material and the component mixture, circulating in said closed path, to cause any undissolved materials therein to go completely into solution, and, following such application of heat to said fixed total amount of the added component mixture, supplying the material, so prepared therefrom, for use.

3,939,006

HYDROGEN ABSORBING MATERIAL FOR ELECTROCHEMICAL CELLS

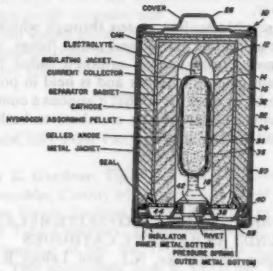
Akiya Kozawa, Middleburg Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 853,311, Aug. 27, 1969, abandoned. This application July 3, 1972, Ser. No. 268,785

Int. Cl. H01m *1/08*

U.S. Cl. 136—6 GC 5 Claims

1. A hydrogen gas absorbing pellet consisting essentially of a solid compound which will react chemically with hydrogen gas, a catalyst for the hydrogen gas consuming reaction, a binder for retaining the solid compound and the catalyst in a desired geometric shaped body which will be porous to hydrogen gas so as to allow the gas to circulate through the body and contact the surface of the solid compound and catalyst, and an



outer sheath encasing said body which is permeable to hydrogen gas but impermeable to liquid.

3,939,007

SODIUM SULPHUR CELLS

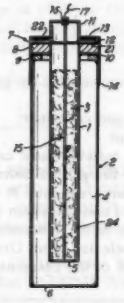
James L. Sudworth, Burton-on-Trent, and Alec R. Tilley, Blackbrook, near Belper, both of England, assignors to British Railways Board, London, England

Filed Jan. 16, 1974, Ser. No. 453,976

Claims priority, application United Kingdom, Jan. 16, 1973, 2267/73

Int. Cl.[2] H01M *10/00*

U.S. Cl. 136—6 FS 5 Claims



1. A sodium-sulphur cell having

a. a metal outer tubular member open at one end and closed at its other end,

b. an inner tubular member extending substantially coaxially of the outer tubular member and open at its end adjacent the open end of the outer tubular member and closed at its other end, the inner tubular member constituting a solid electrolyte for the cell and dividing the cell into anode and cathode compartments, one said compartment being formed by the interior of the inner tubular member and the other said compartment being formed by the annular space between the inner and outer tubular members,

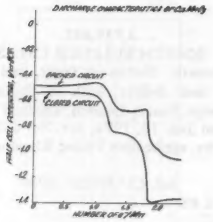
c. an inturned radial flange on the outer tubular member,
d. an out-turned radial flange on the inner tubular member,
e. first compressible sealing means through which said out-turned radial flange abuts said inturned radial flange to close the annular space between said inner and outer tubular members,
f. a closure member for closing said open end of the inner tubular member,
g. second compressible sealing means through which said closure means abuts said out-turned radial flange, and
h. a clamping member having an inturned radial flange which abuts said closure member and is held in position by said outer tubular member so that it applies a compression force axially of said tubular members to both said first and second sealing means.

3,939,008

USE OF PEROVSKITES AND PEROVSKITE-RELATED COMPOUNDS AS BATTERY CATHODES

John M. Longo, New Providence, N.J., and LeRoy R. Clavenna, Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 10, 1975, Ser. No. 548,291
Int. Cl.² H01M *17/00*
U.S. Cl. 136—6 LN **13 Claims**



1. An electrical energy storage device comprising:
a. a container;
b. an electrolyte in said container;
c. a metal anode; and
d. a cathode-active material, said cathode active material being an oxide of the general formula ABO_3 and having perovskite structure, wherein A is selected from the group consisting of non-transition metals of Group IIA of the Periodic Table of the Elements and B is a non-noble transition metal selected from Groups VIIB and VIII of the Periodic Table of the Elements.

3,939,009

METHOD OF MAKING BATTERY PLATE GRIDS FOR LEAD-ACID BATTERIES AND ALLOYS THEREFOR

Stanley Charles Barnes, Coventry, and Robert James Lawrie, Solihull, both of England, assignors to Joseph Lucas (Batteries) Limited, Birmingham, England

Filed Mar. 22, 1974, Ser. No. 453,976
Claims priority, application United Kingdom, Apr. 7, 1973, 16809/73
Int. Cl.² H01M *4/84*; C22C *11/02*
U.S. Cl. 136—66 **7 Claims**

5. A method of manufacturing a battery plate grid for a lead-acid battery comprising the steps of producing a molten alloy consisting of:

Calcium + Lithium	0.22 –1.04 Atomic %
Aluminium	0.035–0.25 Atomic % and
Lead	Remainder

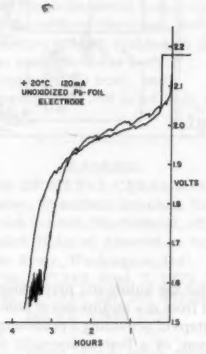
and wherein the atomic percentage of Lithium is not less than 0.15 and does not exceed 0.90 and the atomic percentage of Calcium is not less than 0.07 and does not exceed 0.49, and then casting the molten alloy into the shape of the grid.

3,939,010

MANGANESE DIOXIDE CATHODE

John Ralph Coleman, Ottawa, Canada, and Torstein Valand, Skedsmokorset, Norway, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Sept. 25, 1973, Ser. No. 400,664
Claims priority, application United Kingdom, Oct. 2, 1975, 45358/75
Int. Cl.² H01M *6/30*
U.S. Cl. 136—114 **5 Claims**



1. In a reserve primary cell of the acid Leclanche type having a cathode and an amalgamated zinc anode mounted in a container and arranged to be activatable by the addition of sulfuric acid as electrolyte, the improvement which consists of said cathode being a lead current collector having thereon a layer of anodized lead and having a conductive compressed cathodic layer of manganese dioxide and carbon adhered to said anoidic layer.

3,939,011

LITHIUM CELL WITH INTERNAL AUTOMATIC SAFETY CONTROLS

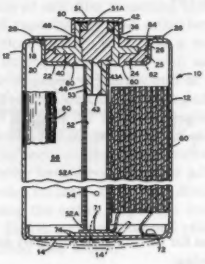
John F. Zaleski, Pleasantville, N.Y., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Jan. 5, 1973, Ser. No. 321,186
Int. Cl.² H01M *2/12*
U.S. Cl. 136—177 **17 Claims**

1. A self-controlling electric primary cell constructed to limit or prevent internal pressure likely to lead to explosive rupture, said cell comprising
a. a container enclosure;
b. anode means;
c. cathode means comprising a depolarizer cathodic body disposed within the cell container;
d. an electrolyte for electrochemically relating said anode means and said cathode means to generate an electric current between them for conduction to an external circuit;
e. an outer electrode element disposed on the outside of said container;
f. an electrical circuit conductor extending from said depolarizer body to said outer electrode element, said circuit

conductor consisting of a filling tube for introducing a fluid electrolyte component into the container can during manufacture, and wherein said filling tube serves as a stationary switch element;

g. electrical switching means disposed within said cell enclosure and responsive to an undesirable operating condition within the cell, which prevent the aggravation of said condition by opening the circuit between the electrical



circuit conductor, the depolarizer and the outer electrode element, wherein the undesirable condition is excessive pressure caused by excessive temperature and excessive current;

h. said electrical switching means including a movable switch element, which cooperates with the stationary switch element and is controlled by said condition within the container.

3,939,012

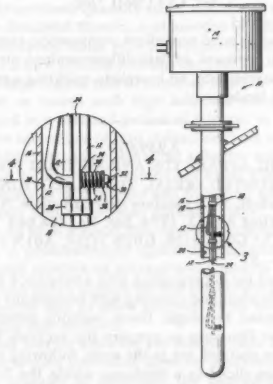
MULTIPOINT THERMOCOUPLE ASSEMBLY USING COIL SPRINGS

Richard David Williams, Houston, Tex., assignor to Instrumatics, Inc., Houston, Tex.

Filed Apr. 21, 1975, Ser. No. 569,818

Int. Cl.² G01K *1/08, 7/04;* **H01L** *35/02*

U.S. Cl. 136—221 **6 Claims**



1. In a thermocouple assembly for obtaining a temperature profile of a process throughout a vessel, which assembly includes a thermocouple having a cold junction and a temperature sensitive end, an enclosure containing said cold junction, a housing extending from the enclosure containing a longitudinal passage therein, the thermocouple being located in the longitudinal passage and extending generally parallel thereto throughout most of its length, the improvement comprising:

a. the temperature sensitive end of the thermocouple extending generally perpendicular to the longitudinal passage and being in contact with the interior of the housing;

b. a support strap located in said longitudinal passage and through which the temperature sensitive end of the thermocouple extends; and

c. coil spring means operatively connected to the temperature sensitive end for maintaining said temperature sensitive end in contact with the interior of said housing.

3,939,013

PROCESS FOR PRODUCING RIMMED ENAMELING STEEL

Larry E. Gardner, Tipp City; John J. Grenawalt, Boardman Township, County of Mahoning, both of Ohio, and Adolph John Birkle, Jackson, Mich., assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

Continuation of Ser. No. 796,148, Feb. 3, 1969, abandoned. This application June 6, 1973, Ser. No. 367,554

Int. Cl.² C21D *7/14*

U.S. Cl. 148—2 **2 Claims**

1. A process for producing a rimmed unkilled enameling steel characterized by a minimum yield strength after firing of 40 ksi, which process comprises:

a. providing a rimmed unkilled steel consisting essentially, in percent by weight, of: 0.02 to 0.08 vanadium; 0.008 to 0.016 nitrogen; 0.2 to 0.7 manganese; 0.04 to 0.16 carbon; and the balance being essentially iron;

b. hot rolling said steel at a temperature in the range of 1590° to 1630°F;

c. cold reducing the hot rolled steel; and

d. subjecting the cold reduced steel to a decarburizing annealing cycle which will produce a substantially homogeneous grain structure throughout its thickness and reduce the carbon content to less than .01 percent, which annealing cycle comprises:

1. heating said steel to a temperature in the range of 1340° to 1350°F and holding at that temperature for about three hours;

2. heating said steel in a wet atmosphere of decarburizing gas in the range of 1340° to 1350°F;

3. heating said steel in a dry atmosphere of decarburizing gas at a temperature in the range of 1340° to 1350°F; and

4. furnace cooling said steel to a temperature of about 200°F.

3,939,014

AQUEOUS ZINC PHOSPHATING SOLUTION AND METHOD OF RAPID COATING OF STEEL FOR DEFORMING

Stuart Reed, Warminster, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Nov. 20, 1974, Ser. No. 525,411

Int. Cl.² C23F *7/10*

U.S. Cl. 148—6.15 Z **9 Claims**

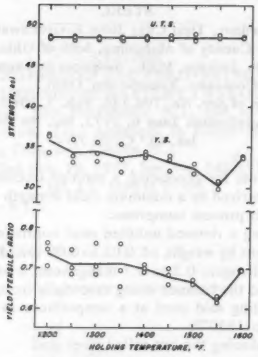
1. A process for forming a zinc phosphate coating on a steel surface comprising contacting the steel surface with an acidic aqueous coating solution consisting essentially of phosphate, zinc and nitrate, wherein the zinc is present in the coating solution in an amount of from about 0.4 to about 1.2 parts by weight for each part of the phosphate and the nitrate is present in the solution in an amount of from about 0.4 to about 1.6 parts by weight for each part of the phosphate, the phosphate being present in the coating solution in an amount of from about 10 g/l to about 150 g/l, the zinc being present in an amount of from about 5 g/l to about 100 g/l, and the nitrate being present in an amount of from about 10 g/l to about 80 g/l and the ratio of total acid to free acid in the coating solution is from about 4.5 to about 8.5 with the total acidity of the coating solution being from about 110 to about 140 points.

3,939,015

IN-LINE HEAT TREATMENT OF HOT-ROLLED ROD

Raymond A. Grange, Washington Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 18, 1974, Ser. No. 534,001
Int. Cl.² C21D 7/14, 9/52
U.S. Cl. 148—12 B 24 Claims



1. In the commercial production of extended lengths of low alloy steel rod having a carbon content below about 0.4%, wherein said rod is cooled from the A_3 temperature thereof to a temperature below 1,200°F in a constrained time period, said period being within the range of 2.5 to 15 minutes; an interrupted cooling procedure for enhancing the ability of said rod to receive subsequent cold-work, said procedure comprising,

a. cooling said rod from said A_3 temperature to a temprature within the range of $T_p \pm 35$°F and holding the rod within said temperature range for a duration of at least 2 minutes, wherein T_p is a function of carbon content as given by:
$(C < 0.28\%)\ T_p = 1{,}585 - 500 \cdot \%C$
$(C > 0.20\%)\ T_p = A_1 - 70$

b. thereafter cooling said rod to about room temperature.

3,939,016

AQUEOUS QUENCHING MEDIUM CONTAINING SALTS OF POLYMERIC MATERIALS

Takashi Tokuue, Yokohama, and Takashi Kato, Yokosuka, both of Japan, assignors to Toho Chemical Industry Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1973, Ser. No. 402,781
Claims priority, application Japan, Oct. 2, 1972, 47-97969
Int. Cl.² B23K 35/24
U.S. Cl. 148—28 3 Claims

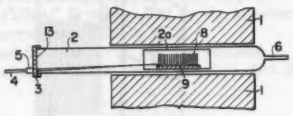
1. A quenching medium comprising an aqueous solution containing 0.4 to 10% by weight of a polymer mixture consisting essentially of 40 to 60% by weight of sodium or potassium polyacrylate and 60 to 40% by weight of a sodium or potassium salt of a copolymer of acrylic acid and methacrylic acid, said polyacrylate and copolymer of acrylic acid and methacrylic acid each having an intrinsic viscosity [η] of 0.010 to 0.050 l/g.

3,939,017

PROCESS FOR DEPOSITING THE DEPOSITION AGENT ON THE SURFACE OF A NUMBER OF SEMICONDUCTOR SUBSTRATES

Noboru Ryugo; Keizo Inaniwa, and Akira Sugiyama, all of Takasaki, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 29, 1974, Ser. No. 456,291
Claims priority, application Japan, Apr. 2, 1973, 48-36757
Int. Cl.² H01L 7/44
U.S. Cl. 148—189 14 Claims



1. A process for diffusing an impurity into a semiconductor wafer comprising:

placing a plurality of semiconductor wafers upright on a boat,

placing a plurality of impurity sources so as to surround and be closely spaced from said wafers,

placing said boat into one end of an elongated tube,

discharging air within said tube from the other end of said tube to thereby establish a vacuum or reduced air atmosphere in said tube, and

heating said semiconductor wafers and impurity sources in said tube to thereby produce a gaseous oxide from said impurity within said tube and diffuse said impurity into said semiconductor wafers.

3,939,018

SOLID PROPELLANT CONTAINING ORGANIC PERCHLORATE SALT AS BURNING RATE ACCELERATOR

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 20, 1968, Ser. No. 761,902
Int. Cl.² C06D 5/06
U.S. Cl. 149—19.1 4 Claims

1. A composite solid propellant composition comprising up to 15 weight percent of tris(difluoroamino)-methoxyethyl ammonium perchlorate, an inorganic oxidizing agent, and an organic resin binder.

3,939,019

COVERING APPARATUS AND METHOD FOR FILM MOUNTED SERIAL TISSUE SECTIONS

John E. P. Pickett, 3323 Pinafore Drive, Durham, N.C. 27705

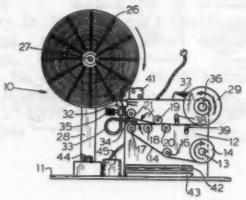
Filed Aug. 2, 1974, Ser. No. 494,064
Int. Cl.² G01N 1/28; G02B 21/34; A01N 1/00
U.S. Cl. 156—57 4 Claims

1. A method for impregnating with a substance which when dry is optically clear and covering with an optically clear cover serially mounted histologic tissue sections mounted on an optically clear film strip to prepare the sections for viewing and where the sections are in the state, following embedding, of having been sliced to a thickness within the 3–12 micron range, of having been serially adhered to one side of said strip, of having been stained and of having had the embedding medium removed from the tissue interstices, comprising the steps:

a. mounting on a film reel adapted for rotation a length of at least three feet of said film strip having serially mounted and adhered thereon a plurality of said 3–12 micron thick sections in said stained state;

b. rotatably mounting proximate said film reel a convolutely wound roll of adhesive tape in continuous tape form, said tape consisting of an optically transparent backing strip and on one side of said strip a coating of pressure sensitive adhesive substance characterized by being dissolvable in a selected solvent, in a dissolved state being adapted to impregnate the interstices of said stained tissue sections when submerged therein and in a dry state when confined in said interstices being optically clear;

c. pulling said tape and film from the respective roll and reel such that the side of said film mounting said sections and the side of said tape having said adhesive substance is guided to a station wherein said tape is maintained flat and horizontal during its travel and with said tape adhesive coated side disposed upwardly and at such said station said film is maintained flat and angled downwardly during its travel at an acute included angle with respect to the tape and with the mounted side of said film having the adhered serial sections disposed downwardly whereby to merge the entire surface of said tape adhesive coated side with the entire surface of said film mounted side and to thereafter bring the entire respective merged surfaces of the tape and film in a closely merged relation preparatory to being rolled into a coil;



d. providing at said station immediately prior to the place of said merger a flow of said selected solvent in which said tape adhesive substance is soluble, said solvent including a predetermined quantity of an additional adhesive substance dissolved therein, said amount of additional adhesive substance being selected to provide at the place of merger a flow of sufficient solvent over the entire surface of said tape coated side to combine with the tape adhesive thereon to insure such tape adhesive being sufficiently dissolved in a selected period of minutes to fully impregnate the interstices of said stained sections and with sufficient additional and compatible adhesive substance being supplied to insure said interstices being filled during the completion of said merger and following such merger to leave said stained sections optically clear;

e. taking up such merged film-tape in a convolutely wound roll at a predetermined speed and tension selected to allow said mixture of solvent and adhesive substance to cover said entire surface of said tape coated side prior to said merger and to allow said roll to be formed without damaging said sections;

f. after said merger allowing the merged tape film to rest in a firmly wound convolute form for a predetermined period of minutes to complete the impregnation of said sections by said dissolved adhesive substances and the setting of such substances;

g. after said period of minutes rewinding said merged tape-film into a convolutely spaced reeled form for drying; and

h. drying said merged tape-film while in said convolutely spaced relation to evaporate said solvent and complete the setting of said adhesive substances.

3,939,020

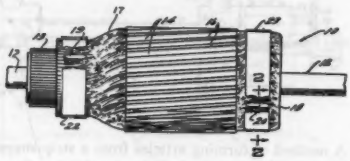
METHOD OF BALANCING A ROTOR

Ara Caramanian, deceased, late of Cincinnati, Ohio, by Adele Jeannette Caramanian, executrix, Cincinnati, Ohio; and John A. Caramanian, Colerain Township, Hamilton County, Ohio, assignors to John A. Caramanian, Colerain Township, Hamilton County, Ohio

Division of Ser. No. 859,049, Sept. 18, 1969, abandoned. This application Feb. 11, 1974, Ser. No. 441,208

Int. Cl.² G01M *1/00*

U.S. Cl. 156—64 **6 Claims**



1. A method of balancing a rotor which comprises applying to the rotor a balancing composition which consists essentially of approximately 23 percent by weight of an epichlorhydrin-bisphenol A epoxy resin, 22 percent of a fibrous inorganic material, 37 percent of powdered weighting material selected from the group consisting of a powdered zinc and powdered barium sulphate, 15 percent of a reactive polyamide having an amino equivalent of 200 to 300, a catalyst and a diluent, the composition having a specific gravity of at least 2.0 and having substantially no slump at room temperature, the composition being sufficiently tacky, adherent, and cohesive to adhere to the rotor during dynamic testing before curing, dynamically testing the rotor with the balancing composition in position thereon, adjusting the amount of the balancing composition on the rotor to achieve balance, and then curing the resin.

3,939,021

PROCESS FOR PRODUCING ARTIFICIAL LEATHER

Yoshifumi Nishibayashi, Sen-nan; Atsushi Shimizu, Takaishi; Yasuhiro Shiga, Osaka; Kenji Okabe, and Ken-ichi Baba, both of Sen-nan, all of Japan, assignors to Toyo Cloth Co., Ltd., Osaka, Japan

Filed Dec. 18, 1973, Ser. No. 425,864

Claims priority, application Japan, June 16, 1973, 48-68113

Int. Cl.² B32B *31/14, 05/20, 05/28*

U.S. Cl. 156—78 **20 Claims**

1. A method for producing artificial leather which comprises:

a. applying a dope comprising 100 parts by weight of a urethane prepolymer having an average molecular weight of 500–10,000 and containing about 2 to 10% by weight of terminal isocyanate groups, about 0.5 to 10 parts by weight of an amine catalyst and about 0.05 to 3 parts by weight of foam stabilizer dissolved in a hydrophobic solvent to a releasing carrier sheet;

b. exposing the resulting coating layer to a moisture containing gas at an absolute humidity of from about 2 to 50 g/m³ and a temperature of 60°–200° C. for a sufficient period of time greater than 0.1 minute to produce microfoam in the coating layer;

c. laminating said coating layer onto a backing material while it is adhesive;

d. allowing the laminated layer to produce a polyurethane layer having a permanent adhesion with the backing material so that an adhesion strength of about 100 to 10,000 g/cm of the width of the transferred lay is obtained; and

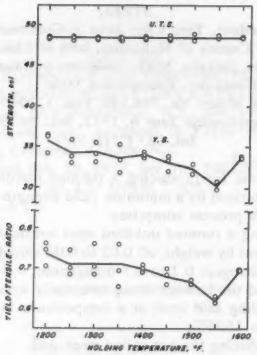
e. stripping off the carrier sheet thereform.

3,939,015

IN-LINE HEAT TREATMENT OF HOT-ROLLED ROD

Raymond A. Grange, Washington Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 18, 1974, Ser. No. 534,001
Int. Cl.² C21D 7/14, 9/52
U.S. Cl. 148—12 B 24 Claims



1. In the commercial production of extended lengths of low alloy steel rod having a carbon content below about 0.4%, wherein said rod is cooled from the A_3 temperature thereof to a temperature below 1,200°F in a constrained time period, said period being within the range of 2.5 to 15 minutes; an interrupted cooling procedure for enhancing the ability of said rod to receive subsequent cold-work, said procedure comprising,

a. cooling said rod from said A_3 temperature to a temprature within the range of $T_p \pm 35$°F and holding the rod within said temperature range for a duration of at least 2 minutes, wherein T_p is a function of carbon content as given by:
($C < 0.28\%$) $T_p = 1{,}585 - 500 \cdot \%C$
($C > 0.20\%$) $T_p = A_1 - 70$

b. thereafter cooling said rod to about room temperature.

3,939,016

AQUEOUS QUENCHING MEDIUM CONTAINING SALTS OF POLYMERIC MATERIALS

Takashi Tokuue, Yokohama, and Takashi Kato, Yokosuka, both of Japan, assignors to Toho Chemical Industry Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1973, Ser. No. 402,781
Claims priority, application Japan, Oct. 2, 1972, 47-97969
Int. Cl.² B23K 35/24
U.S. Cl. 148—28 3 Claims

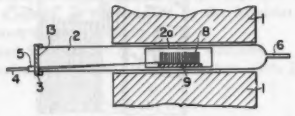
1. A quenching medium comprising an aqueous solution containing 0.4 to 10% by weight of a polymer mixture consisting essentially of 40 to 60% by weight of sodium or potassium polyacrylate and 60 to 40% by weight of a sodium or potassium salt of a copolymer of acrylic acid and methacrylic acid, said polyacrylate and copolymer of acrylic acid and methacrylic acid each having an intrinsic viscosity [η] of 0.010 to 0.050 l/g.

3,939,017

PROCESS FOR DEPOSITING THE DEPOSITION AGENT ON THE SURFACE OF A NUMBER OF SEMICONDUCTOR SUBSTRATES

Noboru Ryugo; Keizo Inaniwa, and Akira Sugiyama, all of Takasaki, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 29, 1974, Ser. No. 456,291
Claims priority, application Japan, Apr. 2, 1973, 48-36757
Int. Cl.² H01L 7/44
U.S. Cl. 148—189 14 Claims



1. A process for diffusing an impurity into a semiconductor wafer comprising:

placing a plurality of semiconductor wafers upright on a boat,

placing a plurality of impurity sources so as to surround and be closely spaced from said wafers,

placing said boat into one end of an elongated tube,

discharging air within said tube from the other end of said tube to thereby establish a vacuum or reduced air atmosphere in said tube, and

heating said semiconductor wafers and impurity sources in said tube to thereby produce a gaseous oxide from said impurity within said tube and diffuse said impurity into said semiconductor wafers.

3,939,018

SOLID PROPELLANT CONTAINING ORGANIC PERCHLORATE SALT AS BURNING RATE ACCELERATOR

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 20, 1968, Ser. No. 761,902
Int. Cl.² C06D 5/06
U.S. Cl. 149—19.1 4 Claims

1. A composite solid propellant composition comprising up to 15 weight percent of tris(difluoroamino)-methoxyethyl ammonium perchlorate, an inorganic oxidizing agent, and an organic resin binder.

3,939,019

COVERING APPARATUS AND METHOD FOR FILM MOUNTED SERIAL TISSUE SECTIONS

John E. P. Pickett, 3323 Pinafore Drive, Durham, N.C. 27705

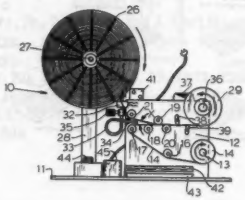
Filed Aug. 2, 1974, Ser. No. 494,064
Int. Cl.² G01N 1/28; G02B 21/34; A01N 1/00
U.S. Cl. 156—57 4 Claims

1. A method for impregnating with a substance which when dry is optically clear and covering with an optically clear cover serially mounted histologic tissue sections mounted on an optically clear film strip to prepare the sections for viewing and where the sections are in the state, following embedding, of having been sliced to a thickness within the 3–12 micron range, of having been serially adhered to one side of said strip, of having been stained and of having had the embedding medium removed from the tissue interstices, comprising the steps:

a. mounting on a film reel adapted for rotation a length of at least three feet of said film strip having serially mounted and adhered thereon a plurality of said 3–12 micron thick sections in said stained state;

b. rotatably mounting proximate said film reel a convolutely wound roll of adhesive tape in continuous tape form, said tape consisting of an optically transparent backing strip and on one side of said strip a coating of pressure sensitive adhesive substance characterized by being dissolvable in a selected solvent, in a dissolved state being adapted to impregnate the interstices of said stained tissue sections when submerged therein and in a dry state when confined in said interstices being optically clear;

c. pulling said tape and film from the respective roll and reel such that the side of said film mounting said sections and the side of said tape having said adhesive substance is guided to a station wherein said tape is maintained flat and horizontal during its travel and with said tape adhesive coated side disposed upwardly and at such said station said film is maintained flat and angled downwardly during its travel at an acute included angle with respect to the tape and with the mounted side of said film having the adhered serial sections disposed downwardly whereby to merge the entire surface of said tape adhesive coated side with the entire surface of said film mounted side and to thereafter bring the entire respective merged surfaces of the tape and film in a closely merged relation preparatory to being rolled into a coil;



d. providing at said station immediately prior to the place of said merger a flow of said selected solvent in which said tape adhesive substance is soluble, said solvent including a predetermined quantity of an additional adhesive substance dissolved therein, said amount of additional adhesive substance being selected to provide at the place of merger a flow of sufficient solvent over the entire surface of said tape coated side to combine with the tape adhesive thereon to insure such tape adhesive being sufficiently dissolved in a selected period of minutes to fully impregnate the interstices of said stained sections and with sufficient additional and compatible adhesive substance being supplied to insure said interstices being filled during the completion of said merger and following such merger to leave said stained sections optically clear;

e. taking up such merged film-tape in a convolutely wound roll at a predetermined speed and tension selected to allow said mixture of solvent and adhesive substance to cover said entire surface of said tape coated side prior to said merger and to allow said roll to be formed without damaging said sections;

f. after said merger allowing the merged tape film to rest in a firmly wound convolute form for a predetermined period of minutes to complete the impregnation of said sections by said dissolved adhesive substances and the setting of such substances;

g. after said period of minutes rewinding said merged tape-film into a convolutely spaced reeled form for drying; and

h. drying said merged tape-film while in said convolutely spaced relation to evaporate said solvent and complete the setting of said adhesive substances.

3,939,020

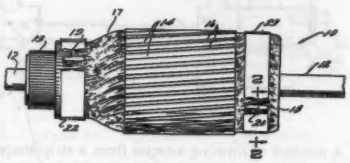
METHOD OF BALANCING A ROTOR

Ara Caramanian, deceased, late of Cincinnati, Ohio, by Adele Jeannette Caramanian, executrix, Cincinnati, Ohio; and John A. Caramanian, Colerain Township, Hamilton County, Ohio, assignors to John A. Caramanian, Colerain Township, Hamilton County, Ohio

Division of Ser. No. 859,049, Sept. 18, 1969, abandoned. This application Feb. 11, 1974, Ser. No. 441,208

Int. Cl.² G01M *1/00*

U.S. Cl. 156—64 **6 Claims**



1. A method of balancing a rotor which comprises applying to the rotor a balancing composition which consists essentially of approximately 23 percent by weight of an epichlorhydrin-bisphenol A epoxy resin, 22 percent of a fibrous inorganic material, 37 percent of powdered weighting material selected from the group consisting of a powdered zinc and powdered barium sulphate, 15 percent of a reactive polyamide having an amino equivalent of 200 to 300, a catalyst and a diluent, the composition having a specific gravity of at least 2.0 and having substantially no slump at room temperature, the composition being sufficiently tacky, adherent, and cohesive to adhere to the rotor during dynamic testing before curing, dynamically testing the rotor with the balancing composition in position thereon, adjusting the amount of the balancing composition on the rotor to achieve balance, and then curing the resin.

3,939,021

PROCESS FOR PRODUCING ARTIFICIAL LEATHER

Yoshifumi Nishibayashi, Sen-nan; Atsushi Shimizu, Takaishi; Yasuhiro Shiga, Osaka; Kenji Okabe, and Ken-ichi Baba, both of Sen-nan, all of Japan, assignors to Toyo Cloth Co., Ltd., Osaka, Japan

Filed Dec. 18, 1973, Ser. No. 425,864

Claims priority, application Japan, June 16, 1973, 48-68113

Int. Cl.² B32B *31/14, 05/20, 05/28*

U.S. Cl. 156—78 **20 Claims**

1. A method for producing artificial leather which comprises:

a. applying a dope comprising 100 parts by weight of a urethane prepolymer having an average molecular weight of 500–10,000 and containing about 2 to 10% by weight of terminal isocyanate groups, about 0.5 to 10 parts by weight of an amine catalyst and about 0.05 to 3 parts by weight of foam stabilizer dissolved in a hydrophobic solvent to a releasing carrier sheet;

b. exposing the resulting coating layer to a moisture containing gas at an absolute humidity of from about 2 to 50 g/m³ and a temperature of 60°–200° C. for a sufficient period of time greater than 0.1 minute to produce microfoam in the coating layer;

c. laminating said coating layer onto a backing material while it is adhesive;

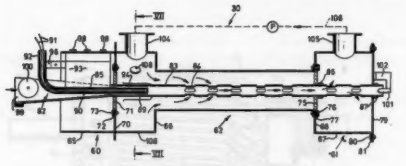
d. allowing the laminated layer to produce a polyurethane layer having a permanent adhesion with the backing material so that an adhesion strength of about 100 to 10,000 g/cm of the width of the transferred lay is obtained; and

e. stripping off the carrier sheet thereform.

3,939,022
METHOD OF FORMING ARTICLES OF FIBROUS MATERIALS

John W. Lacon, Sarnia, Canada, assignor to Fiberglas Canada Limited, Toronto, Canada

Division of Ser. No. 346,381, March 30, 1973, Pat. No. 3,912,572. This application May 22, 1974, Ser. No. 472,260
Claims priority, application Canada, Feb. 1, 1973, 162625
Int. Cl.² B31F 1/00
U.S. Cl. 156—200 23 Claims



1. A method of forming articles from a strip-shaped felt of fibrous material containing heat-hardenable bonding material, comprising the steps of:

supplying the felt longitudinally towards forming surfaces which are spaced apart for receiving the felt therebetween;

pulling the felt longitudinally between said spaced forming surfaces so that said spaced forming surfaces mold the cross-sectional shape of the felt by sliding contact with opposite sides of the felt;

flowing hot gas into one side of the felt, through the entire thickness of the felt and out from the opposite side of the felt to cure the bonding material;

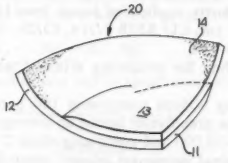
the pulling of the felt being effected by gripping the molded and cured felt; and

cutting the molded and cured felt into predetermined lengths.

3,939,023
METHOD OF CONSTRUCTION OF BRA PAD

Herbert Magidson; Otto L. Huber, both of Beverly Hills, and Helmut Hennrich, Manhattan Beach, all of Calif., assignors to Moldex, Inc., Culver City, Calif.

Filed Nov. 5, 1973, Ser. No. 412,666
Int. Cl.² A41C 3/00
U.S. Cl. 156—211 4 Claims



1. The method of making a bra pad comprising the steps of:

a. making a beveled cut part way across a sheet of fiberfill or the like material, said cut establishing first and second portions of said sheet adjacent to said cut;

b. folding the first of said portions over another part of said sheet and positioning the two edges formed by said beveled cut at right angles to each other, the first portion having a surface thereof in engagement with a surface of said other part of said sheet, the opposite surface of said first portion being exposed and adjacent to the second portion of said sheet;

c. applying a bonding agent to the exposed faces of said first and second portions of said sheet adjacent said beveled cut;

d. forming said sheet into a substantially conical shape by placing said opposite surface of said first portion of said sheet over said second portion and engaging the surfaces of said first and second portions to which bonding agent has been applied;

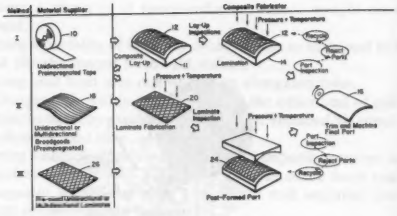
e. placing said form in a heated mold whereby said material will be molded to the contours of said mold; and

f. trimming excess material from said molded form producing a bra pad.

3,939,024
STRUCTURAL REINFORCED THERMOPLASTIC LAMINATES AND METHOD FOR USING SUCH LAMINATES

John T. Hoggatt, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 10, 1974, Ser. No. 459,463
Int. Cl.² B29B 1/00
U.S. Cl. 156—242 3 Claims



1. The method for fabricating a skeletal structure having an outer skin attached thereto consisting essentially of impregnating webs of fiber reinforcing material with a thermoplastic material such that the fiber reinforcing material constitutes about 45% to 65% of the total volume of the impregnated webs, overlapping said webs to form a composite lay-up, forming under heat and pressure a composite essentially planar laminate from the overlapped webs, permitting said thermoplastic material to harden, thereafter forming said planar laminate under heat and pressure into a desired shape, and securing said desired shape between metal cladding to said skeletal structure.

3,939,025
METHOD OF MAKING A POLYETHYLENE TEREPHTHALATE LAMINATE

William Paul Kane, Bon Air, Va., assignor to E. I. DuPont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 281,943, Aug. 18, 1972, Pat. No. 3,924,013. This application Apr. 2, 1974, Ser. No. 457,382
Int. Cl.² B29F 3/00
U.S. Cl. 156—244 3 Claims

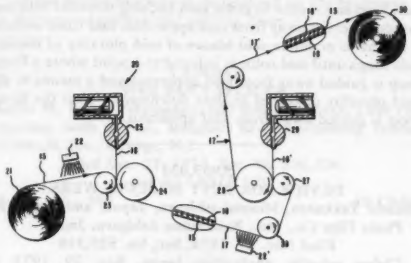
1. A method of making a laminate comprising:

passing a non-browning paperboard having a pH of between 7.0 and 7.5 adjacent a heating source;

heating an uncoated first surface of such paperboard to a temperature of at least about 285°F. by means of the heating source;

extruding a layer of polyethylene terephthalate onto such uncoated first surface of the heated paperboard, such polyethylene terephthalate having an intrinsic viscosity within the range of 0.51 to 0.85; and

cooling the extruded layer of polyethylene terephthalate to solidify it and to effect a bond between the paperboard



and the polyethylene terephthalate to form a 2-ply laminate.

3,939,026

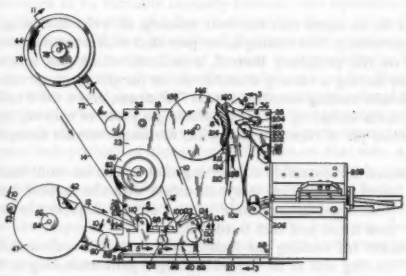
PROCESS OF PREPARING A FILM STRIP FOR HANDLING

Chester H. Petry, Jr., Newberg, and J. Carl Hensley, Portland, both of Oreg., assignors to Byers Photo Equipment, Portland, Oreg.

Division of Ser. No. 291,945, Sept. 25, 1972. This application June 4, 1974, Ser. No. 476,302

Int. Cl.[2] B32B *31/08, 31/20;* **B65H** *21/00*

U.S. Cl. 156—304 **2 Claims**



1. The process of preparing a film strip for handling comprising simultaneously supplying a strip of film and a tab strip of approximately the same thickness from roll sources in longitudinal parallel edge relation on a longitudinal surface between longitudinal side rails and with adjacent edges of said strips disposed on opposite sides of a dividing projection which is of less length than the longitudinal surface and which is spaced from one of the side rails on the side that is to receive the tab strip a lesser distance than the width of the tab strip to cause the latter to buckle laterally when received therein, whereby as said strip portions pass beyond said dividing projection the buckled tab strip straightens out and expands laterally so as to be in adjacent edge relation and in the same plane as the film strip as aforesaid, then supplying from a rolled source a connecting strip having a pressure sensitive surface on one side thereof in overlapping relation on said strips along said adjacent edges, and then pulling the three strips partly around a roller to compress the connecting strip onto said tab and film strips and to secure the pressure sensitive adhesive to the two strips.

3,939,027

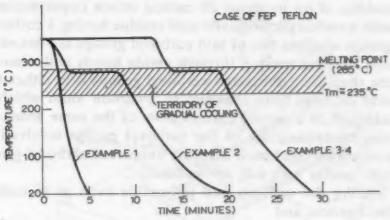
METHOD OF BONDING FLUORO PLASTICS TO A BASE

Shogo Ohya, Kyoto; Momoyoshi Takagi, Yahatacho, and Masao Kurokawa, Tokyo, all of Japan, assignors to Masao Kurokawa, Japan

Filed Aug. 6, 1974, Ser. No. 495,541

Int. Cl.[2] C09J *5/06*

U.S. Cl. 156—306 **3 Claims**



1. A method of bonding a fluoro plastic to a substance to be coated therewith comprising heating a fluoro plastic selected from the group consisting of tetrafluoroethylene-hexafluoropropylene copolymer, polychlorotrifluoroethylene and polyvinylidene fluoride and the substance to a temperature above the melting point of the fluoro plastic and below the point at which the fluoro plastic will be denatured, bringing the substance and the fluoro plastic in the melted state into contact and keeping them at said temperature for a time sufficient to wet the boundary surface between the fluoro plastic and the substance, cooling said boundary surface from the contact temperature to a temperature range between a temperature T_m and $T_m + 50°C$, the temperature T_m being the temperature at which the rate of crystallization of the fluoro plastic is maximized and is given by the formula [(melting point (°C)-+273)×9/10]−273, gradually cooling the boundary surface in said range for at least five minutes, and thereafter cooling the substance and the fluoro plastic to room temperature, whereby the internal stress caused in the fluoro plastic is prevented from being concentrated at the boundary surface.

3,939,028

PROTECTION OF CARBON ARTICLES

Josef Schiffarth; Clive Graham Lorkin, and Kenneth John Fletcher, all of Borken, Germany, assignors to Foseco International Limited, Birmingham, England

Division of Ser. No. 343,217, March 21, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,897

Claims priority, application United Kingdom, Mar. 22, 1972, 13390/72; July 26, 1972, 34986/72

Int. Cl.[2] C09J *5/00, 7/00*

U.S. Cl. 156—306 **9 Claims**

4. A method of protecting the sides of an arc furnace carbon electrode against corrosive attack when subjected to elevated temperatures during use comprising applying to the sides of the electrode at least one preformed self-supporting sheet of a material which comprises an inorganic fusible matrix of graphite-wetting material and particles of a refractory filler and thereafter heating the sides of the electrode to a temperature sufficient to fuse the matrix into a continuous refractory-containing coating which firmly adheres to the sides of the electrode.

3,939,029
METHOD OF BONDING UTILIZING A HEAT ACTIVATED POLYAMIDE ADHESIVE

Kenneth D. Gilliam, Sugar Grove, and Carl Serres, Naperville, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Nov. 16, 1973, Ser. No. 416,442

Int. Cl.² C09J *5/06;* **C08G** *73/10;* **B32B** *27/34, 15/08*

U.S. Cl. 156—331 **10 Claims**

1. A method of adhering surfaces comprising the steps of:

a. placing between the surfaces to be bonded a resinous polyamide having an inherent viscosity greater than 0.2 and containing an aliphatic or cycloaliphatic diamine residue of up to about 20 carbon atoms copolymerized with a carboxylic aromatic acid residue having 3 carboxyl groups wherein two of said carboxyl groups are linked to said diamine residue through amide bonds and wherein the remaining unreacted carboxyl groups is in either the acid or ester form attached to a carbon atom which is adjacent to a second carbon atom of the same aromatic ring containing one of the carboxyl groups involved in said amide bond such that said unreacted carboxyl group can imidize with said amide bond,

b. heating the surfaces and polyamide such as to induce imidization, and

c. cooling the bonded surfaces.

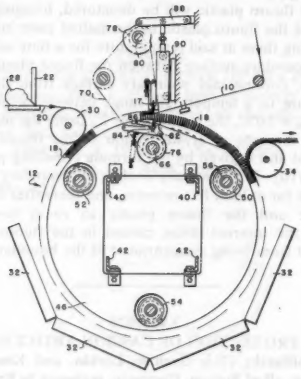
3,939,030
CARPET MACHINE

Charles A. Wethington, and David G. Littlejohn, both of Spartanburg, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 309,489, Nov. 24, 1972, abandoned. This application July 8, 1974, Ser. No. 486,518

Int. Cl.² D04H *13/00;* **D05C** *15/00*

U.S. Cl. 156—435 **5 Claims**



1. Apparatus to produce a bonded pile fabric comprising: a rotor, means to rotate said rotor, means slidably mounting a plurality of blades in said rotor, a second single blade member reciprocably mounted above said plurality of blades and operably associated therewith, means to supply yarn between said plurality of blades and said second blade member, said second blade member having notches in the bottom edge thereof to form high loops and low loops between two blades of said plurality of blades, means to move said second blade member downwardly at a predetermined time to bend the yarn over one blade of said plurality of blades, means to slide upwardly the blade of said plurality of blades next adjacent to the blade over which the yarn is bent to form a loop in said yarn, means to move said second blade member upwardly away from the formed loops, means to periodically move said second blade member in a direction parallel to the axis of said rotor as said second blade member moves upwardly, means to index said rotor to rotate said rotor a predetermined distance to place the blade members in loop forming position, means to supply an adhesive backed backing material into contact with said formed loop, means to set the bond between said adhesive and said loop and means to guide said backing material with loops bonded thereto away from said apparatus, said rotor including a means to maintain said blades of said plurality of blades in said loops until said rotor is indexed to a point where a formed loop is guided away from said apparatus and a means to align said plurality of blades to slide downwardly after the formed loop is guided away from said apparatus.

3,939,031
DEVICE FOR BUTT SPLICING WEBS

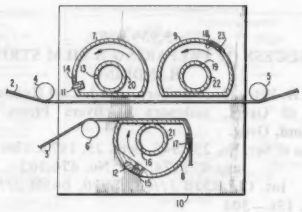
Hisashi Takimoto, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Nakanuma Ashigara, Japan

Filed Nov. 29, 1974, Ser. No. 528,310

Claims priority, application Japan, Nov. 29, 1973, 48-134581

Int. Cl.² B31F *5/06*

U.S. Cl. 156—505 **2 Claims**



1. In an apparatus for butt splicing of webs including a framework, a first cutting drum provided with a cutting member on the periphery thereof, a second cutting and splicing drum having a cutting member on its periphery cooperating with said cutting member of said first drum, and a third splicing drum including means for holding a piece of splicing tape thereon for movement therewith, the improvement comprising:

means for rotatably supporting said drums on said framework for rotation in synchronism with the second drum positioned intermediate of and closely adjacent to said first drum and said third drum,

means for feeding the leading end of a new web and the trailing end of an old web along a path extending in the direction of feed between said second drum and said first drum and said second drum and said third drum, such that the leading end of the succeeding web and the trailing end of the preceding web are sandwiched between said first and second drums to simultaneously sever the same by said cooperating cutting members, and the abutting ends of the succeeding and preceding webs are subsequently sandwiched along with said piece of splicing tape between said second and third drums such that said splicing tape overlies said abutting web ends to splice the same,

said first cutting drum including means on the periphery thereof trailing the cutting member carried by said first cutting drum for holding the trailing end of the preceding web to said first cutting drum after severance thereof,

means on the periphery of the second drum leading said second drum cutting means for holding the leading end of said succeeding web on the periphery of said second and splicing drum, and for holding the leading end of the succeeding web after cutting, on the periphery of said second cutting and splicing drum to the position where the abutting ends of the preceding and succeeding webs

are spliced by the piece of splicing tape at the splicing zone;

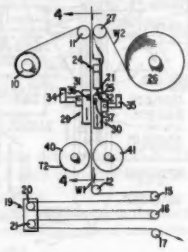
whereby, the cut portion of the trailing end of the preceding web is maintained in contact with the periphery of the first cutting drum and the cut portion of the leading end of the succeeding web is maintained on the periphery of the second cutting and splicing drum.

3,939,032

WEB BUTT SPLICER

Charles M. Taitel, Parsippany, and Ralph L. Ryan, Lake Parsippany, both of N.J., assignors to Compensating Tension Controls, Inc., Orange, N.J.

Filed Dec. 27, 1974, Ser. No. 536,726
Int. Cl.² B31F 5/06
U.S. Cl. 156—505 **10 Claims**



1. Apparatus for butt splicing the end of web material from a spare roll to web material being drawn from a depleting supply roll comprising in combination a knife member mounted to be movable laterally between two operative positions on either side of a line having sides facing toward and away from said line in each of the operative positions and having an end perpendicular to said line providing a knife edge on each side of said knife member, means for directing the web in use along said line, means on each side of said knife member for securing the end portion of the spare roll web to that side thereof facing away from said line with the end of the spare web positioned along the knife edge on that side, a pair of plate members on either side of said line movable parallel to said line and each having an end parallel to and facing said end of said knife member, means for moving the plate member on the opposite side of said line from the knife member to align said end thereof with said end of said knife member to cooperate therewith in severing the web in use, tape pressing means mounted on each of said plate members, means for moving the plate member on the same side of the line as the knife member to operatively position said tape pressing means thereon, means for stopping the movement of the web along said line, means for moving the knife member across said line while the web is stopped to cut the web in use and butt the end of the spare web thereto, and means for operating said operatively positioned tape pressing means while the web is stopped to press the overlapping portion of a tape applied to and overlapping the web end carried by the knife member against the cut end of the web in use to splice the spare web thereto.

3,939,033

ULTRASONIC WELDING AND CUTTING APPARATUS

Frank J. Grgach, Danbury, and Everett A. Harris, Ridgefield, both of Conn., assignors to Branson Ultrasonics Corporation, New Canaan, Conn.

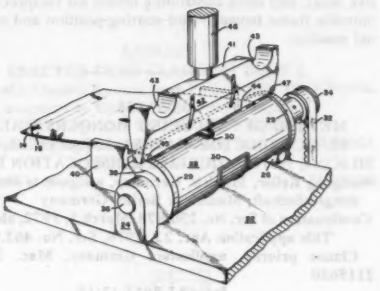
Filed Dec. 16, 1974, Ser. No. 532,847
Int. Cl.² B06B 3/00; B29C 27/08
U.S. Cl. 156—515 **18 Claims**

1. In an ultrasonic welding and cutting apparatus for welding and cutting soft film and fabric material, the combination of:

horn means adapted to be resonant at a predetermined frequency having an input surface for receiving vibratory energy of said frequency and an opposite frontal surface for transferring the received energy to material in contact with said frontal surface;

electroacoustic means coupled to said horn means at its input surface for rendering said horn means resonant;

anvil means disposed opposite said frontal surface for supporting the material for contact with said frontal surface



to provide for energy transfer from said horn means to the material, said anvil means including a pattern of raised welding and cutting surfaces in the shape of an article to be produced, and raised bearing surface means for impact by said frontal surface, and

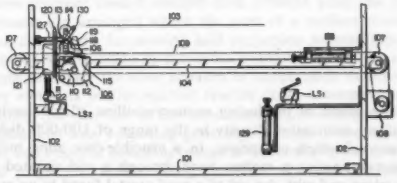
said horn being constructed to exhibit substantially uniform motional excursion of said frontal surface in the direction toward said anvil at the region opposite said pattern of welding and cutting surfaces and including means for producing reduced motional excursion of said frontal surface at the region of impact with said bearing surface means.

3,939,034

TAB TAPE SPLICING APPARATUS

Iwao Tanaka, Tokyo; Yukio Shiratori, Higashikurume, and Hidetaro Iijima, Urawa, all of Japan, assignors to Nichiban Co., Ltd., Tokyo, Japan

Filed June 7, 1974, Ser. No. 477,272
Claims priority, application Japan, Feb. 20, 1974, 49-19421
Int. Cl.² B32B 31/04
U.S. Cl. 156—522 **10 Claims**



1. An apparatus for splicing a tab tape to a pressure-sensitive adhesive sheet comprising: a guide rail arranged opposite to an adhesive surface of a pressure-sensitive adhesive sheet and extending in the breadthwise direction of said sheet; a movable frame slidably carried on said guide rail and having a tab tape holder; an arm pivotably attached to said movable frame and normally biased into an upright position by a spring to guide, press and fasten a tab tape to said adhesive surface

of said pressure-sensitive adhesive sheet; a splicing roll rotatably attached to one end of said arm; a stopper attached to said movable frame to restrain the movement of said arm in said upright position; a ratchet mechanism mounted on said movable frame whereby said arm is allowed to rotate in a direction in which said arm is tiltable; a projecting rod provided at a starting position of said movable frame on said guide rail to release said ratchet mechanism; a hydraulic piston cylinder unit provided at a terminal position of said movable frame on said guide rail to rotate said arm in said tiltable direction; cutting means for cutting said tab tape between said splicing roll and an end edge of said pressure-sensitive adhesive sheet; and drive controlling means for reciprocating said movable frame between said starting position and said terminal position.

3,939,035

METHOD OF PRODUCING MONOCRYSTALLINE SEMICONDUCTOR MATERIAL, PARTICULARLY SILICON, WITH ADJUSTABLE DISLOCATION DENSITY

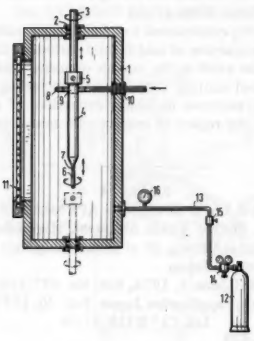
Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich & Berlin, Germany

Continuation of Ser. No. 230,878, March 1, 1972, abandoned. This application Apr. 22, 1974, Ser. No. 462,936

Claims priority, application Germany, Mar. 31, 1971, 2115650

Int. Cl.[2] B01J *17/18*

U.S. Cl. 156—618 **1 Claim**



1. Method of producing monocrystalline silicon having a uniform dislocation density in the range of 100,000 dislocations/cm² which comprises, in a crucible-free zone melting process, passing a molten zone through a rod situated in a recipient and with the aid of a seed crystal fused to an end of the rod converting the rod into a monocrystalline silicon rod free of dislocations, permitting the rod to cool, and then using the dislocations which exist on the end of the rod due to the zone - melting process as seeds, passing a heated zone through the dislocation-free monocrystalline silicon rod at a maximum temperature of 1370°C in the direction opposite to the direction of the zone melting process at a speed of 1–2 mm/min. to impart to said dislocation-free monocrystalline silicon rod a uniform dislocation density in the range of 100,000 dislocations/cm².

3,939,036

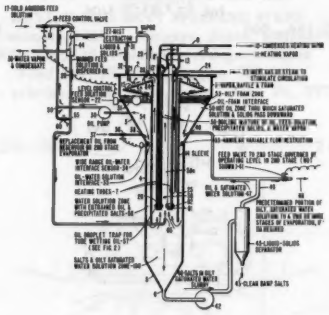
HEAT EXCHANGERS AND EVAPORATORS

Ransome W. Erwin, Ogden, Utah, assignor to Austral-Erwin Engineering Co., Houston, Tex.

Continuation-in-part of Ser. No. 306,183, Nov. 14, 1972. This application Oct. 25, 1973, Ser. No. 409,659

Int. Cl.[2] B01D *1/100;* **C10G** *33/00;* **B01D** *1/26, 3/34*

U.S. Cl. 159—47 R **18 Claims**



1. The method of evaporating an aqueous feed solution containing dissolved solids or mineral salts and separating the resulting product into individual components without adherence of the solids or mineral salts to any surfaces contacting the aqueous solution, said method being carried out in an evaporating and separating apparatus which comprises (1) an evaporating chamber including a confined heating and vaporizing zone having heating elements therein and (2) succeeding separating chambers or zones separate from the evaporating chamber said succeeding chambers or zones including separating zones for (a) misty vapors, (b) oily foam, (c) hot oil, (d) oily aqueous solution, and (e) oily aqueous solution solids-slurry; all contacting surfaces of said evaporating and separating apparatus, including the evaporating chamber and the succeeding chambers or zones, being formed of preferentially oil wettable material, and all contacting surfaces of said evaporating chamber being formed of substantially zero water adsorbent polymeric fluorocarbon material; which method comprises the following steps:

a. Flowing the aqueous solution as an continuous medium mixed with sufficient dispersed oil to form a continuous film of oil on all preferentially oil wettable contacting surfaces, flowing said aqueous solution upwardly through said confined heating and vaporizing zone and therein contacting said heating elements, the surfaces of which are substantially zero water adsorbent and totally wetted with a film of oil, thereby converting a portion of the aqueous solution to water vapor and precipitated solids, thus forming a mixture comprising hot oil, misty vapors, solids, and the remaining aqueous solution; and

b. Separating the mixture of hot oil, misty vapors, solids, and remaining aqueous solution (still the continuous water medium) into components thereof in said succeeding separating zones or chambers in which substantially all surfaces contacting these materials are preferentially oil wettable.

3,939,037

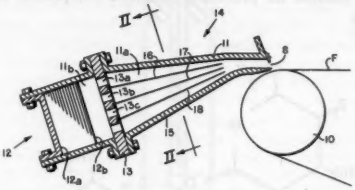
HEADBOX WITH FLEXIBLE TRAILING ELEMENTS

Lester M. Hill, Cassville, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 345,436, March 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 121,775, March 8, 1971, abandoned, which is a division of Ser. No. 698,633, Jan. 17, 1968, Pat. No. 3,607,625. This application Mar. 14, 1974, Ser. No. 451,225. The portion of the term of this patent subsequent to Sept. 21, 1988, has been disclaimed.

Int. Cl.[2] D21F *1/02*

U.S. Cl. 162—341 13 Claims



1. In a headbox for delivering stock to a forming surface, the headbox having a slice chamber and a slice opening, the improvement comprising:

a flexible element positioned in the slice chamber for stock flow induced movement and extending in the direction of stock flow, and

means supporting said element in the slice chamber with its downstream portion unattached, whereby a fine scale turbulence is produced in the stock without large scale eddies.

3,939,038

NUCLEAR REACTOR, CORE VESSEL INTERCEPT CONSTRUCTION

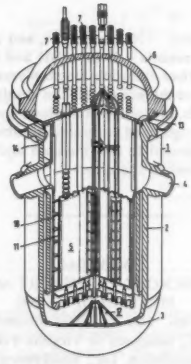
Konrad Pernstich, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 18, 1973, Ser. No. 380,471

Claims priority, application Germany, July 28, 1972, 2237208

Int. Cl. G21c *9/00*

U.S. Cl. 176—38 8 Claims



1. A pressurized-water nuclear reactor including a pressure vessel having a substantially cylindrical side wall and a substantially hemispherical bottom wall above which a core vessel is positioned by its top, with its lower end spaced above this bottom wall, and means extending upwardly from the latter towards said lower end for intercepting said core vessel if it accidentally falls, said pressure vessel having a cover and pressurized-water coolant connections; wherein the improvement comprises said means being formed by a structural metal framework inside of said vessel and supported by said bottom wall at a plurality of interspaced positions, said framework extending upwardly until at least adjacent to the core vessel's said lower end, at least some of said interspaced locations being adjacent to the peripheral portion of said bottom wall, said framework being made of ductile metal and having upper portions proportioned to deform beyond the elastic limit of the metal and absorb the shock of intercepting said core vessel when it falls.

3,939,039

REACTOR CORE CLAMPING DEVICE

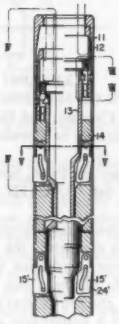
Katumi Seki; Masaru Kawara, and Yasuo Tachi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 12, 1973, Ser. No. 378,690

Claims priority, application Japan, July 12, 1972, 47-69064

Int. Cl. G21c *3/12*

U.S. Cl. 176—87 14 Claims



1. For use in a nuclear reactor having a core, a clamping device for clamping a plurality of core elements together in forming the core, comprising: projection means being movably mounted on a core element for movement between a withdrawn position and a position projecting outwardly from a core element toward another core element when the core elements are arranged within the core of a nuclear reactor; operating means for moving said projection means from its withdrawn position to its projected position a predetermined length to clamp the core element in cooperation with other core elements of the nuclear reactor core; a wrapper tube forming the exterior of the core element mounting with its longitudinal axis extending generally vertical in the reactor core and being of hexagonal shape in horizontal cross section; said projection means being provided adjacent the upper portion of said wrapper tube; said operating means being mounted within said wrapper tube for vertical movement; said wrapper tube having a hole within one of its side walls for said projection means; said projection means moving generally horizontally from within said wrapper tube in its withdrawn position horizontally through its hole to project horizontally beyond said hole and outside of said wrapper tube in its projected position; and separate lock means for locking said vertically moving operating means and said wrapper tube against relative movement in one of said projection means positions.

3,939,040

ENZYMATIC BATING METHOD

Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Apr. 23, 1974, Ser. No. 463,392
Claims priority, application Germany, Apr. 28, 1973, 2321629
Int. Cl.² C14C 1/06
U.S. Cl. 195—6 2 Claims

1. A method for bating soaked, limed, dehaired skins and hides which comprises contacting said skins and hides for 15 minutes to 300 minutes with an aqueous bath having a temperature from 25° to 35°C. and a pH between 7.5 and 10, said aqueous bath comprising an enzyme mixture consisting essentially of

a. a bacterial protease having an optimum efficacy towards hemoglobin at a pH from 10 to 12, and

b. a fungus protease having an optimum efficacy toward casein at a pH above 7, a neutral to weakly alkaline bacterial protease, papain, trypsin, or a mixture of these proteases, said enzyme mixture being present in an amount equivalent to 0.3 to 6.5 percent, by weight of said skins and hides, of enzymes having an enzymatic activity of 1000 Loehlein-Vollhardt units.

3,939,041

METHOD OF MAKING FRUCTOSE

Donald J. Lartigue, Corning, and Howard H. Weetall, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 31, 1974, Ser. No. 475,157
Int. Cl.² C12D 13/00
U.S. Cl. 195—31 F 1 Claim

1. A method of preparing fructose from an aqueous dextrose solution which comprises the step of reacting the solution under incubation conditions with crosslinked bacterial cells of an organism of the genus Streptomyces, the crosslinked cells having glucose isomerase activity and being the reaction product of a suspension of individual cells having glucose isomerase activity and an aqueous solution of tetrazotized benzidine, the tetrazotized benzidine solution having dissolved therein between about 4.0 and 20.0 mg of tetrazotized benzidine per gram of cells.

3,939,042

PROCESS FOR THE PRODUCTION OF L-GLUTAMIC ACID

Kiyoshi Nakayama, Sagamihara; Mamoru Kobata, Kawasaki; Yoshitake Tanaka, Machida; Tadaaki Nomura, Tokyo, and Ryoichi Katsumata, Maebashi, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1974, Ser. No. 495,272
Claims priority, application Japan, Aug. 11, 1973, 48-89679
Int. Cl.² C12D 13/06; C12K 1/02
U.S. Cl. 195—49 6 Claims

1. A process for producing L-glutamic acid which comprises culturing a mutant strain derived from a microorganism having an ability to utilize methanol and an ability to produce L-glutamic acid and belonging to a genus selected from Pseudomonas and Protaminobacter, said mutant having at least one property selected from a) a requirement for L-methionine, b) a requirement for L-isoleucine, c) a requirement for L-phenylalanine and d) a resistance to DL-lysine hydroxomate, in a medium containing methanol as the principal carbon source, accumulating L-glutamic acid in the culture liquor and recovering L-glutamic acid therefrom.

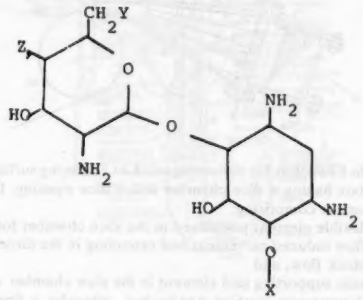
3,939,043

ANTIBIOTICS DESIGNATED XK-88 SERIES AND PROCESS FOR PRODUCTION THEREOF

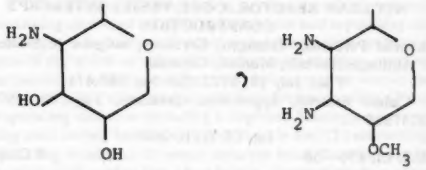
Takashi Nara, Tokyo; Seigo Takasawa, Hadano; Ryo Okachi, Machida; Isao Kawamoto, Machida; Mitsuyoshi Yamamoto, Machida; Seiji Sato, Machida; Tomoyasu Sato, Machida, and Atsuko Morikawa, Tama, all of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 21, 1974, Ser. No. 516,816
Claims priority, application Japan, Oct. 24, 1973, 48-118932
Int. Cl.² C12D 9/00
U.S. Cl. 195—80 R 7 Claims

1. A method for producing antibiotic compounds of the formula



wherein X represents



or —H; Y represents —NH_2 or —OH, and is —NH_2 when X is —H; and Z represents —H or —OH and is —H when X is —H, which comprises culturing *Streptomyces hofuensis* ATCC 21970, or a mutant thereof capable of producing at least one of said compounds, in a nutrient medium containing assimilable sources of nitrogen and carbon until substantial antibacterial activity is imparted to said medium and isolating at least one of said compounds therefrom.

3,939,044

ANAEROBIC MICROBE TRANSPORT ASSEMBLY AND METHOD OF USING

Tracy Dale Wilkins, and Franklin Jimenez-Ulate, both of Blacksburg, Va., assignors to Virginia Polytechnic Institute Educational Foundation, Inc., Blacksburg, Va.

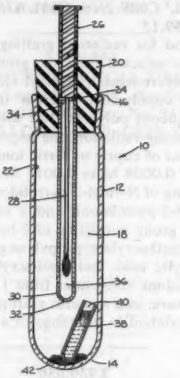
Filed Apr. 23, 1975, Ser. No. 570,641
Int. Cl.² C12B 1/00
U.S. Cl. 195—126 26 Claims

1. An assembly for maintaining anaerobic microorganisms, which comprises;

a. a first tubular container having hermetically sealed ends and which defines a hermetically sealed chamber;

b. means disposed in said chamber for removing gaseous oxygen;

c. a second tubular container having a closed end and an open end and which defines a compartment, said second container being mounted on said first container so that there is no communication between said chamber and



said compartment, said compartment being in open communication with the atmosphere outside of said chamber;

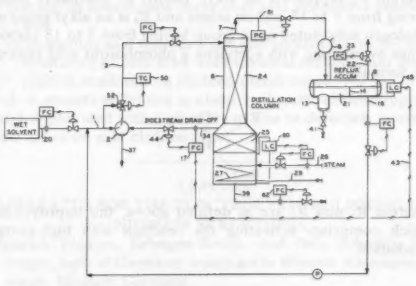
d. means of hermetically sealing said open end at will; and

e. means of establishing communication between said chamber and said compartment when said open end is hermetically sealed.

3,939,045
DISTILLATION METHOD AND APPARATUS

Harry L. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 284,619, Aug. 29, 1972, abandoned. This application Jan. 9, 1974, Ser. No. 431,944
Int. Cl.² B01D *3/42*
U.S. Cl. 203—1 **6 Claims**



1. A method for distilling the normally liquid media remaining after a catalytic polymerization to separate the polymerization solvent from components in the normally liquid media which have greater and lesser volatility comprising,

a. introducing the normally liquid media into a distillation zone;

b. withdrawing an overhead stream comprising components having volatility higher than that of the polymerization solvent along with some of the polymerization solvent, a side stream comprising said polymerization solvent and a bottom stream comprising components having lower volatility than the polymerization solvent;

c. accumulating the polymerization solvent that is in the overhead stream in a reservoir; and,

d. sensing the level of the polymerization solvent in said reservoir and controllably withdrawing said side stream from said distillation zone responsive to said level of said polymerization solvent in said reservoir.

3,939,046
METHOD OF ELECTROFORMING ON A METAL SUBSTRATE

Gordon A. Conn, Verona, and William R. Gass, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1975, Ser. No. 572,813
Int. Cl.² C25D *1/00, 1/02, 5/44*
U.S. Cl. 204—4 **10 Claims**

1. A method of making a metal article comprising the steps of:

1. providing an aluminum master substrate having at least one surface which is desired to be reproduced, said surface being covered with an oxidized layer;

2. making the aluminum master substrate cathodic at a current density of between about 10A/sq. ft. to about 500A/sq. ft., in an aqueous electrically conducting solution selected from the group consisting of an acid solution or acid salt solution or mixtures thereof which will not etch aluminum, said solution having a temperature of up to about 50°C, said current causing evolution of gas at the solution-oxidized surface interface and chemical activation effective to thin and smooth the oxidized layer without removing it;

3. coating the smoothed, oxidized surface of the aluminum master substrate with a thin metal layer; and

4. dissolving the aluminum master substrate and the attached oxidized layer, to provide a metal article having a surface that is the negative duplicate of the surface of the master substrate.

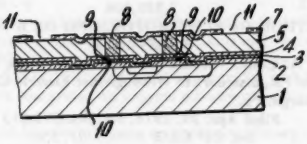
3,939,047
METHOD FOR FABRICATING ELECTRODE STRUCTURE FOR A SEMICONDUCTOR DEVICE HAVING A SHALLOW JUNCTION

Hideo Tsunemitsu, and Hiroshi Shiba, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 305,673, Nov. 13, 1972, Pat. No. 3,848,260. This application Aug. 29, 1974, Ser. No. 501,633
Claims priority, application Japan, Nov. 15, 1971, 46-91405
Int. Cl.² C25D *5/02;* **H01L** *23/48*
U.S. Cl. 204—15 **13 Claims**

1. A method of fabricating a semiconductor device comprising the steps of providing a semiconductor substrate, forming an insulating film over the upper surface of said substrate except for predetermined portions thereof, successively forming first, second, and third metal layers on said substrate and said insulating film, said first metal layer being capable of being alloyed with said semiconductor substrate at a first temperature, said first metal layer having a thickness less than

the depth of the shallowest junction in the substrate, said second metal layer being capable of being alloyed with said substrate at a second temperature higher than said first temperature, said third metal layer having a good electric conductivity and being thicker than any of said first and second metal layers, anodically oxidizing said third metal layer to convert



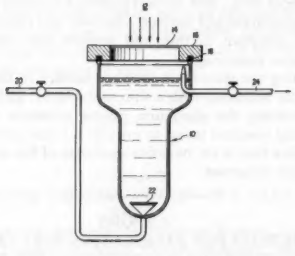
the selected portion thereof into an insulator to the surface of said second metal layer, anodically oxidizing those portions of said second and first metal layers which are aligned with said selected portion of said third metal layer, and thereafter performing heat treatment for alloying a portion of said first metal layer with said substrate at a temperature below said second temperature.

3,939,048

PROCESS FOR MAKING ANHYDROUS METAL HALIDES

Warren H. Philipp, North Olmsted; Stanley J. Marsik, Fairview Park, and Charles E. May, Rocky River, all of Ohio, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Nov. 27, 1974, Ser. No. 527,728
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 H **10 Claims**



1. A process for the preparation and isolation of high purity anhydrous lower valence state metal halides comprising

dissolving the corresponding higher valence state metal halide of the desired lower valence metal halide in an organic liquid, said organic liquid being selected such that the higher valence state metal halide is soluble therein and the lower valence state metal halide is insoluble therein, and

subjecting the solution to high energy radiation which reduces the higher valence state metal halide to its corresponding lower valence state metal halide at a temperature in the range of from about 0°C. to about room temperature.

3,939,049

PROCESS FOR RADIATION GRAFTING HYDROGELS ONTO ORGANIC POLYMERIC SUBSTRATES

Buddy D. Ratner, and Allan S. Hoffman, both of Seattle, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 10, 1974, Ser. No. 459,734
Int. Cl.² C08F *2/46*; C08L *43/04*, *83/10*
U.S. Cl. 204—159.13 **7 Claims**

1. In a method for radiation grafting hydrogels onto an organic substrate selected from the group consisting of silicone rubber, polyurethane, polyvinyl chloride, and polyurethane-polyether copolymers wherein the substrate is immersed in an aqueous polymer graft solution and thereafter subjected to ionizing radiation, the improvement comprising adding an amount of cupric or ferric ions within the concentration range of 0.0008 M to 0.0016 M to an aqueous graft solution consisting of N-vinyl-2-pyrrolidone monomer or mixtures of N-vinyl-2-pyrrolidone and a second monomer selected from the group consisting of 2-hydroxyethyl acrylate, 2-hydroxyethyl methacrylate, propylene glycol acrylate, acrylamide, methacrylic acid, and methacrylamide, wherein the N-vinyl-2-pyrrolidone constitutes from 1/20 to 18/20 by volume of said mixture, said aqueous graft solution comprising a total monomer content in the range of 4 to 40% by volume.

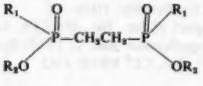
3,939,050

PROCESS FOR THE PREPARATION OF ETHANE-1,2-DIPHOSPHINIC ACID DIESTERS

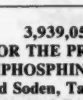
Hans-Jerg Kleiner, Bad Soden, Taunus, and Sigurd Rösinger, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 17, 1974, Ser. No. 434,029
Claims priority, application Germany, Mar. 19, 1973, 2313581
Int. Cl.² B01J *1/10*
U.S. Cl. 204—162 HE **7 Claims**

1. In a process for the preparation of an ethane-1,2-diphosphinic acid diester of the formula



wherein R_1 represents an alkyl, phenyl or phenalkyl group having from 1 to 18 carbon atoms and R_2 is an alkyl group or a halogen substituted alkyl group having from 1 to 18 carbon atoms by reacting with acetylene a phosphorous acid ester of the formula



wherein R_1 and R_2 are as defined above, the improvement which comprises activating the reaction with high-energy irradiation.

3,939,051

PROCESS FOR ELECTRODEPOSITION OF CATIONIC THERMOSETTING COMPOSITIONS

Carl C. Anderson, Gibsonia, and Joseph R. Marchetti, Greensburg, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 2, 1971, Ser. No. 168,433
Int. Cl.² C25D *13/06*
U.S. Cl. 204—181 **5 Claims**

1. A method of coating an electrically-conductive substrate which comprises passing electric current between an anode

and a cathode in contact with an aqueous coating composition comprising an interpolymer of:

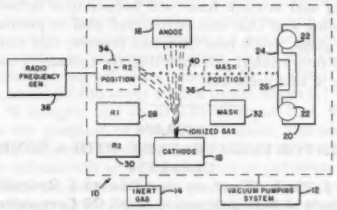
a. from about 5 to about 50 percent by weight of a secondary or tertiary nitrogen-containing aminoalkyl monomer;
b. from about 5 to about 80 percent by weight of reaction product comprising a half-blocked diisocyanate and an unsaturated hydroxyl-containing monomer; and
c. from about 0 to about 90 percent by weight of at least one ethylenically unsaturated monomer.

3,939,052

DEPOSITING OPTICAL FIBERS

Leon H. Riley, 7707 Logan Drive SW., Huntsville, Ala. 35802

Filed Jan. 15, 1975, Ser. No. 541,363
Int. Cl.² C23C *15/00*; G02B *5/16*
U.S. Cl. 204—192 **3 Claims**



1. A process for depositing and positioning optical fiber cores onto a base tape in a predetermined manner, comprising:

evacuating a vacuum enclosure;
filling said enclosure with an inert gas;
forming an ionized plasma within said enclosure;
positioning a supply of cladding material in a target position;
energizing a tape feed to pass plastic tape over a deposition position;
actuating a control means to cause sputtering of said cladding material onto said plastic tape;
removing said cladding material supply from said target position;
positioning a supply of fiber core material in said target position;
placing an interruption mask over said deposition position, and
re-energizing said tape feed and said control means to cause sputtering of said fiber core material through said interruption mask onto a cladded plastic tape.

3. A process as defined in claim 1 wherein said interruption mask is provided with a plurality of slits to definitely position fiber cores on said cladded tape.

3,939,053

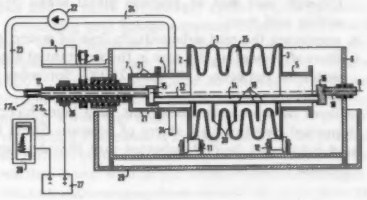
APPARATUS FOR THE ELECTROLYTIC POLISHING OF NIOBIUM STRUCTURES

Heinrich Diepers, Erlangen-Bruck, and Otto Schmidt, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 289,543, Sept. 15, 1972, Pat. No. 3,850,769. This application June 28, 1974, Ser. No. 484,247
Int. Cl.² C25F *7/00*
U.S. Cl. 204—212 **5 Claims**

1. Apparatus for electrolytically polishing a hollow niobium body comprising:

a. an open tank having side walls and a bottom adapted to accept an electrolyte made up of an aqueous solution of sulfuric and hydrofluoric acid;
b. at least one tubular flange rotatably supported in the wall of said tank capable of accepting a hollow niobium body having an opening therein in such a manner that the hollow niobium body can be aligned with the flange;
c. said flange positioned in said tank whereby said niobium body attached to said flange will be disposed in said tank partially immersed in electrolyte which can be filled therein;
d. a stationary hollow cathode extending from the exterior of said tank through said flange and adapted to extend into said hollow body which will be attached to said flange, said cathode having holes in the wall of the portion thereof which will be disposed within said body;
e. pump means for circulating electrolyte through said hollow cathode;
f. means for rotating said flange;
g. means for providing a constant voltage source and including two terminals, one of which is coupled to said cathode and the other of which includes means for coupling to the hollow body which will be attached to said flange; and
h. switching means for turning said voltage on and off.

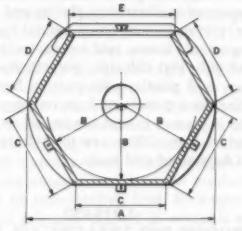


3,939,054

NONSYMMETRICAL HEXAGONAL ELECTROPLATING BARREL

Albert Singleton, 7360 Brookside Park, Middleburg Heights, Ohio 44130

Filed Dec. 13, 1974, Ser. No. 532,725
Int. Cl.² C25D *17/20*
U.S. Cl. 204—213 **13 Claims**



1. An electroplating barrel assembly of polypropylene adapted for use in electroplating in combination with electrodes bounded by two end pieces and five foraminous side panels joined along their edges to form a closed polygonal enclosure having one side opening,

the side opening having a width greater than the width of any of the side panels and being adapted to receive a door to completely enclose anything within the barrel,

the width of the two side panels adjacent the side opening being less than the width of at least half the remaining side panels.

3,939,055

LAMINATED ASBESTOS DIAPHRAGM

Robbie T. Foster, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 3, 1973, Ser. No. 403,137
Int. Cl.² C25B *13/06*; B32B *19/08*
U.S. Cl. 204—295 3 Claims

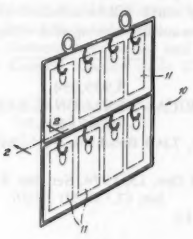
1. A laminated asbestos diaphragm comprising;
1. an asbestos mat, which mat has been treated by the process comprising:
   a. drawing an aqueous alkali metal hydroxide solution through said mat to provide alkali metal hydroxide within said mat;
   b. rendering the mat substantially free of water; and
   c. thereafter heating the mat in the substantial absence of water to between 110° and 280°C. for more than 2 hours;
2. a layer of asbestos on said mat, said layer having been deposited by drawing a slurry of asbestos fibers through said previously heated asbestos mat thereby depositing asbestos fibers on said asbestos mat.

3,939,056

COATED PLATING RACK

Shimetomo Fueki, Tokyo; Shigeo Ohuchi, and Kazuhiro Ogawa, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 19, 1973, Ser. No. 408,179
Int. Cl.² C25D *17/08*
U.S. Cl. 204—297 W 2 Claims



1. A rack for supporting electrically non-conductive articles during the successive electroless plating and electroplating of such articles, said rack comprising a metal frame, and a plastic resin coating on said frame, said resin selected from the group consisting of polyvinyl chloride, polyethylene, polyester and polyurethane, said plastic resin coating having substantially uniformly dispersed therein at least one organosulphur compound which is present in said coating in an amount between approximately 1.5 and 200 grams of said organosulphur compound per kilogram of said resin.

3,939,057

PROCESS FOR TREATING OIL SHALE

Thomas G. Reed, Jr., 818 Heather Court, Houston, Tex. 77024

Filed Jan. 18, 1974, Ser. No. 434,598
Int. Cl.² C10G *1/02*; C10B *47/06*
U.S. Cl. 208—11 10 Claims

1. A process for producing a crude shale oil and a high BTU gas comprising
feeding a mixture of a major amount of crushed oil shale and a minor amount of coal, sufficient to provide process heat which is needed in excess of that supplied by burned char, to a rotary preheater,
heating said mixture to a temperature less than that at which decomposition of kerogen begins, said heating by direct contact of said mixture with a flow of hot gases,
passing said preheated mixture to a rotary retort,
indirectly heating said mixture to a temperature in the range of 850° to 1050°F. with said hot gases, said hot gases indirectly heating said rotary prior to contacting said mixture in said preheater,
taking off a vaporous overhead comprising shale oil and tar oil and leaving a char on said shale,
passing said retorted mixture to a hopper,
removing residual shale oil by sweeping said hopper with superheated steam,
passing said vaporous overhead and stripped shale oil residual to a high temperature condenser,
condensing an oil fraction at a temperature above 212°F from said vaporous overhead and said hopper residual shale oil,
passing the uncondensed gases from said high temperature condenser to a low temperature condenser,
condensing water from said uncondensed gas,
recovering a high BTU gas,
passing said mixture from said hopper to a furnace, and burning said char and unvolatized coal to produce said hot gases, which pass from said furnace, first contacting said rotary retort and then directly contacting said mixture in said preheater.

3,939,058

METHOD FOR FLUID CRACKING WITH A COMPOSITE CATALYST

Charles J. Plank, Woodbury, and Edward J. Rosinski, Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 765,723, July 31, 1968, which is a division of Ser. No. 280,421, May 14, 1963, abandoned. This application Jan. 26, 1970, Ser. No. 5,929
Int. Cl.² C10G *11/02*, *11/04*; B01J *29/06*
U.S. Cl. 208—120 15 Claims

1. A method of converting a charge of hydrocarbon material to hydrocarbon products which comprises contacting said charge under hydrocarbon conversion conditions with a crystalline zeolite catalyst composition prepared by:
   a. exchanging the zeolite with a solution containing at least one exchangeable cation to at least partially replace the original cation;
   b. heating the exchanged zeolite at a temperature of 500° to 1600°F;
   c. compositing the resulting zeolite with a porous matrix material; and
   d. contacting the resultant composite with a solution containing at least one exchangeable cation other than the original cation.

14. The catalyst composition prepared by the steps recited in claim 1 wherein the final exchange is with an ammonium salt.

3,939,059

HYDROCARBON CONVERSION WITH AN ACIDIC SULFUR-FREE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 14, 1975, Ser. No. 550,083
Int. Cl.² C10G *35/08*, *13/08*; B01J *27/06*; C07C *5/24*
U.S. Cl. 208—139 20 Claims

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic sulfur-free catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 2 wt. % rhenium, and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, cobalt, and rhenium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the

elemental metallic state, and wherein substantially all of the cobalt and rhenium are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

3,939,060

HYDROCARBON CONVERSION WITH A SULFIDED ACIDIC CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 288,864, Sept. 13, 1972, Pat. No. 3,846,282. This application Oct. 29, 1974, Ser. No. 518,700

Int. Cl.[2] C10G *35/06, 13/02*

U.S. Cl. 208—139 14 Claims

1. A process for catalytically reforming a gasoline fraction to produce a high octane reformate which comprises contacting the hydrocarbon at reforming conditions with a sulfided acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.01 to about 5 wt. % nickel, about 0.1 to about 3.5 wt. % halogen, and about 0.01 to about 1 wt. % sulfur, wherein the platinum or palladium, iridium, and nickel are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium, nickel, and iridium are present therein in a sulfided state or in the corresponding elemental metallic states, and wherein the composite is sulfided, prior to contact with the hydrocarbon and after substantially all of the platinum or palladium, iridium, and nickel contained therein have been reduced to the corresponding elemental metallic state, by treatment with a sulfiding gas at conditions selected to incorporate about 0.01 to about 1 wt. % sulfur.

3,939,061

PROCESS FOR REACTIVATION OF IRIDIUM-CONTAINING CATALYSTS

John D. Paynter, Louisville, Ky., and Richard R. Cecil, Mendham, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 16, 1973, Ser. No. 388,741

Int. Cl.[2] C10G *35/08;* B01J *23/96*

U.S. Cl. 208—140 22 Claims

13. In a process for the catalytic reforming of hydrocarbons wherein a hydrocarbon feedstock is contacted with a reforming catalyst comprising an iridium hydrogenation dehydrogenation component composited with an alumina support at reforming conditions, the catalyst having been at least partially deactivated during contact with said feedstock by the deposition of coke deposits thereon, a method for reactivating said catalyst after discontinuing contact of said catalyst with said feedstock comprising:

a. contacting a bed of said catalyst in a reaction zone with a gaseous mixture containing oxygen at partial pressures of at least about 0.1 psi at temperatures ranging from 575°F. to about 850°F. for a period ranging from about 0.1 to about 48 hours to burn at least a substantial portion of said coke deposits therefrom, the duration of said contacting at said elevated temperature being insufficient to convert more than about 70 weight percent of the iridium component of said catalyst to agglomerates having crystallite sizes greater than about 50A;

b. contacting a bed of said coke depleted catalyst, without subsequent contacting with a substantially halogen-free, oxygen-containing gas at temperature sufficient to reagglomerate the iridium on said catalyst in a plurality of cycles, an initial cycle of which includes the steps of

i. contacting said coke depleted catalyst in a reaction zone with hydrogen or a hydrogen-containing gas at temperature ranging from about 400°F. to about 1100°F. to reduce a substantial portion of said iridium component of said catalyst to its metallic form;

ii. contacting said reduced catalyst having a substantial portion of the iridium contained thereon in the metallic form in a reaction zone with a substantially oxygen-free gas which contains halogen in concentration ranging from about 0.01 mole percent to about 10 mole percent at a temperature of at least about 850°F., continuing said contacting not substantially beyond the point of halogen breakthrough from the exit side of the bed of said catalyst;

and one or more subsequent cycles which includes

iii. contacting said halogen-treated catalyst in a reaction zone with a hydrogen or a hydrogen-containing gas at temperature ranging from about 400°F. to about 1100°F. for time sufficient to convert a substantial portion of said iridium component of said catalyst to its metallic form; and then

iv. contacting said catalyst having a substantial portion of the iridium contained thereon in the metallic form in a reaction zone with a gas which contains halogen in concentration ranging from about 0.01 mole percent to about 10 mole percent at a temperature of at least about 850°F., continuing said contacting not substantially beyond the point of halogen breakthrough from the exit side of the bed of said catalyst.

3,939,062

CATALYST REGENERATION PROCEDURE

John H. Sinfelt, Berkeley Heights, and James L. Carter, Chatham, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 16, 1973, Ser. No. 388,746

Int. Cl. C10g *35/08;* B01j *11/18*

U.S. Cl. 208—140 20 Claims

7. In a process for the catalytic conversion of a naphtha feed stock wherein a naphtha feed sotck and hydrogen are contacted with a catalyst comprising from about 0.01 to about 3.0 wt. % of an iridium component and a chlorine component contained on a refractory inorganic oxide support at reforming conditions, the catalyst having been at least partially deactivated during contact with said naphtha feed stock by the deposition of carbonaceous residues, a method of regenerating said catalyst comprising (1) contacting said catalyst, after contact with said naphtha feed stock with an oxygen-free chlorine-containing reagent in a gaseous medium from the group consisting of hydrocarbon feed, hydrogen containing gas, inert gas and mixtures thereof in amounts sufficient to increase catalyst chlorine content to about 1.0 to about 4.0 wt. %, based on anhydrous catalyst, and (2) contacting said treated catalyst with a substantially sulfur-free gaseous mixture containing oxygen, a chlorine-containing reagent, and water at a temperature of less than about 1050°F. for a time sufficient to burn at least a substantial portion of said carbonaceous residues from said catalyst, said gaseous mixture containing 0.1 to 1.0 mole percent oxygen and a concentration of chlorine-containing reagent equivalent in chlorine content to 20 to 2000 ppm by volume of HCl, the molar ratio of water to said equivalent HCl in said gaseous mixture being less than about 10:1.

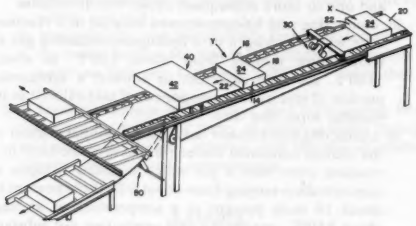
11. The process of claim 7 wherein said catalyst additionally contains a platinum component.

3,939,063

LOOSE FLAP DETECTOR AND CASE EJECTOR SYSTEM FOR WRAP-AROUND PAPERBOARD CARTONS

Otis A. Epperson, Greenwood, and Raymond H. Smith, Ft. Smith, both of Ark., assignors to Gerber Products Company, Fremont, Mich.

Filed Oct. 10, 1974, Ser. No. 513,673
Int. Cl.² B03B 1/00
U.S. Cl. 209—7 3 Claims



1. In a packaging line of the type including transport means for moving a sequence of filled wrap-around paperboard cartons past a plurality of work stations to detect the presence of insecurely sealed closure flaps thereon, the improvement comprising:

impact means at a first of said work stations having at least one weighted roller pivotally suspended in the path of said cartons so as to allow said roller to arcuately strike the leading side wall of each of said cartons during movement by said transport means and thereafter to allow said roller to roll over the top surface of said moving cartons to open any insecurely sealed flap thereof;

optical open-flap detector means at a second of said work stations, said detector means including a plurality of spaced light source-photocell pairs in light beam alignment, positioned so that the light beam received by each of said photocells will be interrupted when a corresponding one of said closure flaps is in an open position; and

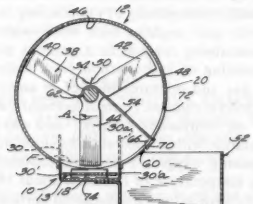
diverter means for removing cartons having so-detected open flaps from said packaging line.

3,939,064

FEED CLEANER

Dee Dexter Allen, Zeeland, Mich., assignor to U. S. Industries, Inc., New York, N.Y.

Filed Dec. 4, 1974, Ser. No. 529,467
Int. Cl.² B07B 13/00
U.S. Cl. 209—44 17 Claims



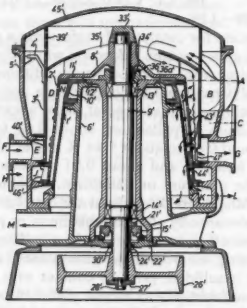
1. A poultry feed cleaner for cleaning feed being conveyed along a feed trough comprising in combination: a drive shaft rotatably mounted in a direction generally parallel to the direction of the feed trough, a plurality of axially spaced generally aligned blades secured to said shaft and extending radially therefrom, said blades being rotated with said shaft for transverse movement through the feed being conveyed through said trough, said blades being spaced from each other sufficiently to remove foreign matter in the feed without removing any sufficient amounts of feed.

3,939,065

SCREENING DEVICE

Sten Eskil Einarsson Ahlfors, Box 3691, S-776 00 Hedemora, Sweden

Filed Aug. 23, 1973, Ser. No. 391,038
Claims priority, application Sweden, Aug. 31, 1972, 11251/72
Int. Cl.² B07B 1/22
U.S. Cl. 209—240 16 Claims



1. A device for purifying and fractionating a material suspension, notably a fiber suspension, under pressure, said device including

a treatment chamber having a circular cross-section, with an inlet for the suspension and outlets for reject and accept, respectively;

a screening drum having a circular cross-section and rotatable in the treatment chamber, said drum being provided with pulsation organs;

said inlet being exterior of said drum,

each pulsation organ having a limited extension along the axial dimension of said drum, and a rounded front surface, said organ being adapted to create pulsations in the suspension layer close to the screening drum,

said drum being perforate to provide an array of screen holes spaced on the surface of said drum,

the number of screen holes being considerably larger than the number of pulsation organs and

at least one screen hole being located on the surface of each said pulsation organ at its leeward side, viewed in the direction of rotation of said drum, thereby causing a local return flow outwardly through said screening drum.

3,939,066

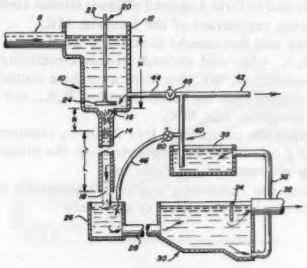
SEWAGE TREATMENT PROCESS

William J. Bauer, 422 South Park Road, La Grange, Ill. 60525

Continuation of Ser. No. 290,853, Sept. 21, 1972, abandoned. This application Aug. 6, 1974, Ser. No. 495,212
Int. Cl.² C02C 1/08
U.S. Cl. 210—6 11 Claims

1. A process of treating aqueous sewage material containing organic solids particles during flow of such material, including subjecting said material to a positive pressure in a first zone in a receptacle, flowing such material abruptly from such zone of positive pressure downward through a generally vertical conduit in a manner to provide a reactor zone of near absolute zero pressure subjacent said receptacle and full conduit flow beneath said reactor zone, precluding entry of air into said reactor zone, flowing such material from said zone of positive pressure into and through said reactor zone at high velocity,

causing water vapor and gases suddenly to be separated and released in said material in said reactor zone, and permitting such water vapor and gases to expand suddenly in said reactor



zone, thereby rupturing organic solids particles in said sewage material by the sudden expansion of such water vapor and gases and thereby disintegrating said particles into substantially smaller particles.

3,939,067

METHOD AND APPARATUS FOR TREATING SEWAGE

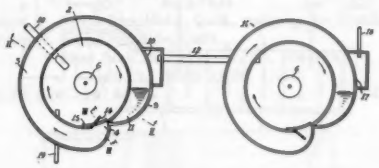
Peter H. Huisman, Pretoria, South Africa, assignor to Gypsum Industries Limited, Transvaal, South Africa

Filed Oct. 30, 1973, Ser. No. 411,158

Claims priority, application South Africa, Mar. 21, 1973, 73/1972

Int. Cl.² C02C *1/08*

U.S. Cl. 210—7 **12 Claims**



1. In activated sludge treatment of sewage in a chamber having a center, the improvement comprising a) imparting to the sewage in the chamber a spiral motion about the chamber center, b) using the motion imparted to the sewage to cause liquid-born sludge in the chamber to flow from the chamber into and along a canal around the chamber, c) returning at least part of the liquid-born sludge under the influence of gravity directly from the canal back into the chamber after flowing said sludge in the canal substantially around the chamber.

4. Apparatus suitable for use in activated sludge treatment of sewage and comprising a tank having a central chamber with a floor and a centre, canal means for slow and non-turbulent flow of sludge around the chamber, an overflow weir from the chamber into the canal means, underflow weir means to permit sludge in the canal means to flow directly from the canal means into the chamber, a deflecting wall in the canal means co-operating with the underflow weir means and an outlet from the canal means adjacent the deflecting wall and upstream thereof.

3,939,068

PROCESS FOR TREATING WASTE WATER CONTAINING CELLULOSE NITRATE PARTICLES

Theodore M. Wendt, Franklin, and Arthur M. Kaplan, Newton, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 422,458, Dec. 6, 1973, abandoned. This application Feb. 4, 1975, Ser. No. 546,953

Int. Cl.² C02C *1/06*

U.S. Cl. 210—7 **12 Claims**

1. A process for treatment of a waste stream from nitrocellulose manufacture containing at least 50 ppm of insoluble, non-biodegradable nitrocellulose material which comprises the following steps taken in sequence:

a. chemically digesting by reacting with alkali at a pH of at least 11.5 said insoluble nitrocellulose material in said waste stream to convert said insoluble material to soluble and biodegradable organic and nitrate products,

b. neutralizing said waste stream upon completion of said chemical digestion to a pH within the range of about 6.0 to 9.0,

c. combining said neutralized waste stream with domestic raw sewage and with a microbially utilizable carbon material to form a mixed liquor, said raw sewage added in sufficient quantity to reduce the nitrate content of the mixed liquor to less than 200 ppm and said carbon material added in sufficient quantity to sustain microbial denitrification of substantially all nitrates in the mixed liquor,

d. microbially denitrifying said liquor to convert the nitrate content of said mixed liquor to nitrogen gas, and thereafter separating solids from said liquor,

e. subjecting the solids-free liquor from step (d) to an aerobic microbial treatment to break down the organic products and to convert reduced nitrogen compounds present in said liquor to nitrates, and

f. microbially denitrifying the effluent from step (e) to reduce the nitrate compounds to nitrogen gas and to provide a substantially nitrate-free effluent having an ecologically acceptable BOD level.

3,939,069

ARTIFICIAL KIDNEY AND A METHOD OF ULTRAFILTERING A LIQUID

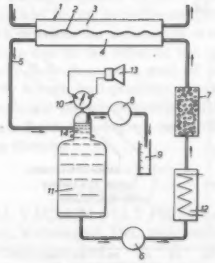
Alain Granger, Lesigny, and Andre Sausse, Sceaux, both of France, assignors to Rhone-Poulene-Textile, Paris, France

Filed Dec. 6, 1972, Ser. No. 312,515

Claims priority, application France, Dec. 6, 1971, 71.43720

Int. Cl.² B01D *31/00*, *13/00*

U.S. Cl. 210—22 A **12 Claims**



1. A method of ultrafiltration of a liquid comprising the steps of providing a constant volume closed system having a wall portion forming a membrane of an ultrafiltration apparatus, connecting the face of the membrane remote from said constant volume closed system to the liquid to be ultrafiltered, filling said system with a dialysis liquid, circulating the dialysis

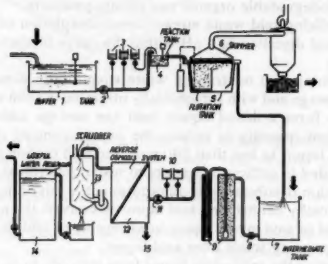
liquid along said membrane at a flow rate corresponding to the normal conditions of a haemodialysis operation and withdrawing by pumping a fraction of said dialysis liquid from the system at a predetermined rate, so that the volume of liquid in said system is maintained constant.

3,939,070

METHOD AND INSTALLATION FOR THE TREATMENT OF WASTE WATER TO FORM USEFUL WATER

Hanspeter Roth, Effretikon, Switzerland, assignor to "Swissair" Schweizerische Luftverkehr-AG, Zurich, Switzerland

Filed July 10, 1974, Ser. No. 486,949
Claims priority, application Switzerland, July 13, 1973, 10289/73
Int. Cl.² B01D *31/00, 13/00*
U.S. Cl. 210—23 H 5 Claims



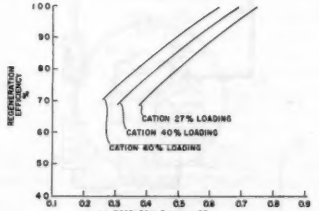
1. A method for the treatment of industrial waste water for forming useful water, comprising the steps of:
   a. subjecting the waste water to a chemical flocculation treatment;
   b. floating the flocculate and turbid portions of the waste water which are formed during the flocculation treatment by electro-flotation; and
   c. subjecting the clarified water to filtration by reverse osmosis.

3,939,071

RECOVERABLE REGENERANTS FOR CATIONIC EXCHANGE RESINS

Arthur Katzakian, Jr., Sacramento, and David O. DePree, Loomis, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Aug. 12, 1974, Ser. No. 496,482
Int. Cl.² B01D *15/06*
U.S. Cl. 210—34 15 Claims


REGENERATION LEVEL %
CATION 27% LOADING
CATION 40% LOADING
CATION 60% LOADING
g-eq. REGENERANT / g-eq. OF THEORETICAL RESIN CAPACITY

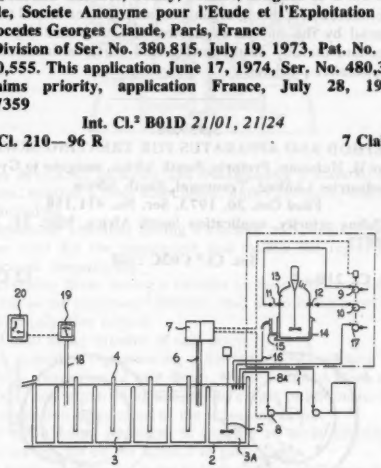
1. A method of recovering and recycling spent ion-exchange regenerants comprising the steps of:
   1. passing through a first, separate bed of spent, weakly basic, anion exchange resin containing bound inorganic anion, X, a weak organic base anion regenerant, R_a, to regenerate said resin and to form a first effluent stream containing spent anion regenerant of the formula, R_aX;
   2. passing through a second, separate bed of spent, weakly acidic cation exchange resin containing bound inorganic cation, M, a cation regenerant, R_c, selected from an hydroxy or alkoxy substituted alkanoic acid to regenate said resin and to form a second effluent stream containing spent cation regenerant of the formula, MR_c;
   3. combining said first stream containing spent anion regenerant, R_aX, with said second stream containing spent cation regenerant, MR_c, to form a mixture containing a strongly dissociated, ionizable complex, R_cR_a, and reconstituted inorganic salt, MX;
   4. dissociating the complex to free R_c or R_a regenerant;
   5. separating one of the regenerants from the mixture and recycling it to one of said beds; and
   6. separating the remaining regenerant from the mixture and recycling it to the other of said beds.

3,939,072

APPARATUS FOR GENERATING AN OXIDIZING REAGENT FOR THE TREATMENT OF POLLUTED WATER

Eric Jourdan LaForte, Ecully, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Division of Ser. No. 380,815, July 19, 1973, Pat. No. 3,900,555. This application June 17, 1974, Ser. No. 480,302
Claims priority, application France, July 28, 1972, 72.27359
Int. Cl.² B01D *21/01, 21/24*
U.S. Cl. 210—96 R 7 Claims

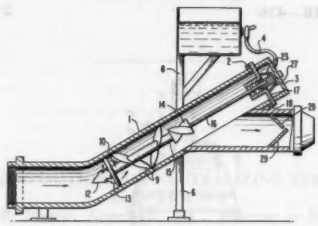


1. A generator assembly for generating and supplying reagents to a treatment tank, comprising:
   a reactor;
   overflow means connected to said reactor for maintaining a constant level therewithin and delivering any overflow above the constant level out of the generator assembly for delivery to the treatment tank;
   two inlet pipes disposed symmetrically in the upper part of said reactor;
   two reagent proportioning pump means, each for supplying proportioned amounts of reagent to a respective one of said inlet pipes;
   a single motor means connected to said two reagent proportioning pump means for driving both of said pump means; and
   regulator means connected to said motor means for controlling said motor means in a predetermined manner in response to the conditions sensed external to the generator assembly in the treatment tank.

3,939,073
APPARATUS FOR DEODORIZING LIQUIDS

Jules Bats, Place de la Gare, 40 - Mugron (Landes), France

Filed Nov. 26, 1974, Ser. No. 527,275
Int. Cl.² B01F 7/02; B05B 7/06; B01F 7/08
U.S. Cl. 210—152 8 Claims

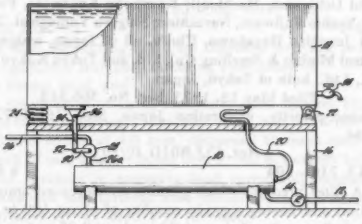


1. Apparatus for admixing a deodorizing liquid with a bad smelling liquid, comprising a generally Y-shaped hollow body comprised by a base having an upper and a lower end, a first leg and a second leg, and said legs meeting the base at an angle to each other, means supporting the Y-shaped body in an inclined position with the base and the first leg at an acute angle to a horizontal and the second leg below said first leg, the base and the legs intersecting in a vertical plane, means for introducing a deodorizing liquid into the lower end of the base, fixed mixing means within the base above said introducing means for admixing the deodorizing liquid and the bad smelling liquid, rotatable mixing means above the fixed mixing means in said body, an inclined shaft having a lower and an upper end extending coaxially through said first leg for rotating said rotatable mixing means, said fixed mixing means supporting the lower end of said shaft, and means at the upper end of said shaft for rotating said shaft.

3,939,074
APPARATUS FOR CONTROL OF A REVERSE OSMOSIS SYSTEM

Donald T. Bray, Escondido, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.

Filed June 28, 1974, Ser. No. 484,120
Int. Cl.² B01D 33/00, 13/00
U.S. Cl. 210—257 M 2 Claims



1. A reverse osmosis system comprising a module containing a semipermeable membrane, a pipe for introducing feed water under elevated pressure into said module, means for releasing brine from said module while retaining operating pressure therein, a rigid storage tank for temporarily storing purified water passed through the semipermeable membrane in said module, and a pipe for transferring purified water from said module into said storage tank; in which the improvement comprises:

a. a valve in one of said pipe introducing feed water under elevated pressure into said module, and said pipe for transferring purified water from said module into said rigid storage tank;

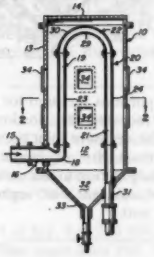
b. a resilient support for an end of said rigid storage tank; and,

c. a mechanical linkage between the resiliently supported end of said rigid storage tank which actuates said valve at a predetermined vertical displacement of said resiliently supported end of said rigid storage tank caused by the weight of purified water therein.

3,939,075
THICKENING APPARATUS

Marvin E. Ginaven, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Continuation of Ser. No. 81,980, Oct. 19, 1970, abandoned.
This application Nov. 10, 1972, Ser. No. 305,547
Int. Cl.² B01D 35/00
U.S. Cl. 210—258 13 Claims



1. A thickener in a system flowing solids in a slurry form under pressure and in a relatively large volume, said thickener being enclosed to express fluids under conditions of non-exposure to the atmosphere by a housing having lower and upper ends and providing at the lower end an inlet and an outlet and a drain for expressed fluids, a relatively thin slurry being admitted to said housing by way of said inlet and discharging in a thickened form from said outlet, said thickener including a continuous unobstructed duct structure within said housing including vertically oriented up and down duct sections communicating at respective lower ends with said inlet and said outlet and comprising screen walls in relatively closely spaced approximately parallel relation bridged at their lateral extremities by short interconnecting walls to provide for the slurry to move therein in a thin sheet-like flow, said vertical duct sections extending upwardly within the housing toward the upper end thereof and having adjacent of their ends to one end thereof interconnected by an imperforate generally arcuate duct section which provides for a direction reversing continuous slurry flow from one to the other of the vertical sections of said duct, slurry flow through a part of said duct being opposed by gravity forces, and portions of said vertical duct sections being perforate for an expression of fluids into said housing, expressed fluids flowing to said drain and exiting from said housing thereby.

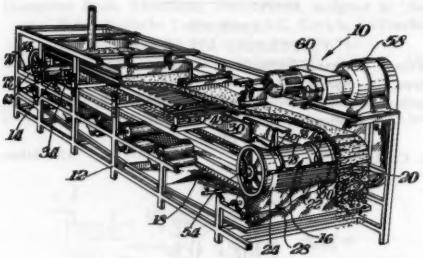
3,939,076
HORIZONTAL VACUUM BELT FILTER MACHINE

Kenneth T. Seibert, Wilmington, Del., assignor to Straight Line Filters, Inc., Wilmington, Del.

Filed Dec. 20, 1974, Ser. No. 534,833
Int. Cl.² B01D 33/04
U.S. Cl. 210—400 3 Claims

1. In a horizontal vacuum belt filter machine of the type comprising a frame, spaced apart drum means journaled to the frame at opposite ends thereof, endless belt means mounted on the drum means having an upper horizontal path of travel and comprising a plurality of separate longitudinally aligned

endless belt segments, an endless filter medium supported upon the endless belt means in the area of the upper horizontal path of travel, and suction means beneath the upper horizontal path of travel cooperating with the endless belt means and the filter medium for withdrawing liquid from slurry-like material deposited upon the filter medium, the improvement being characterized by the separate endless belt segments



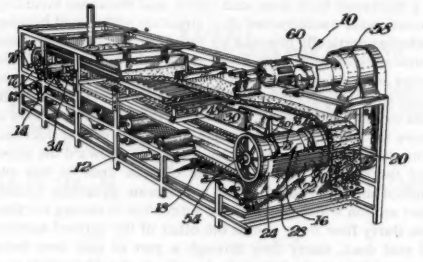
each including edge portions recessed for overlapping sealing engagement with the recessed edge portion of an adjacent belt segment to form a leak resistant joint therebetween along the horizontal path of travel, the overlapping joint additionally acting by frictional cooperation to minimize relative longitudinal slippage between adjacent belt segments as they travel along the horizontal path.

3,939,077

HORIZONTAL VACUUM BELT FILTER MACHINE

Kenneth T. Seibert, Wilmington, Del., assignor to Straight Line Filters, Inc., Wilmington, Del.

Filed Dec. 20, 1974, Ser. No. 534,834
Int. Cl.² B01D *33/14*
U.S. Cl. 210—401 **6 Claims**



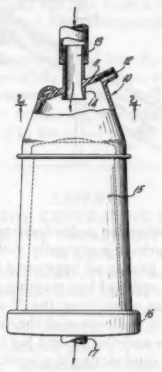
1. In a horizontal vacuum belt filter machine of the type comprising a frame, spaced apart drum means journaled to the frame at opposite ends thereof, endless belt means mounted on the drum means having an upper horizontal path of travel and comprising a plurality of separate longitudinally aligned endless belt segments, an endless filter medium supported upon the endless belt means in the area of the upper horizontal path of travel, and suction means beneath the upper horizontal path of travel cooperating with the endless belt means and the filter medium for withdrawing liquid from slurry-like material deposited upon the filter medium, the improvement being characterized by the spaced apart drum means at one end of the frame including a plurality of independent drums having the plurality of endless belt segments mounted thereon, each independent drum being jounaled upon an axle for rotation independently of the others, and means for adjusting the longitudinal spacing of the axles relative to each other.

3,939,078

EXTRACORPOREAL FILTER

Francis Martin Servas, Belle Mead, N.J., and Jorge Torres, Newbury Park, Calif., assignors to Johnson & Johnson, New Brunswick, N.J. and Puralator, Inc., Del.

Filed Apr. 19, 1974, Ser. No. 462,452
Int. Cl.² B01D *35/00*
U.S. Cl. 210—436 **2 Claims**



1. An extracorporeal blood filter having improved characteristics for removing excess gas from the blood being filtered comprising a filter media mounted in a housing; said housing having a straight, smooth, uniformly sloped top surface from a low point positioned at the circumference of said housing to a high point positioned at the circumference of said housing directly opposite said low point, an inlet for the blood positioned in the top surface, a gas vent positioned at said high point, said blood inlet having a portion extending below the sloped top surface into the housing, said portion being free and open and not in contact with any other part of said filter whereby gas escaping to the vent is directed away from the entering bloodstream.

3,939,079

FILTER MEDIUM WHICH PERMITS INCREASED AMOUNT OF FILTRATION

Hiroshi Uchiyama, Hachiouji; Kazunobu Kakimoto, Funabashi; Yoshio Fujiwara, Narashino; Shigeru Yamagishi, Tokyo, and Junshiro Hayakawa, Chofu, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd. and Tokyo Kokyu Rozai Co., Ltd., both of Tokyo, Japan

Filed May 15, 1973, Ser. No. 360,512
Claims priority, application Japan, May 15, 1972, 47-047984
Int. Cl.² B01D *39/20*
U.S. Cl. 210—504 **6 Claims**

1. A filter medium which permits an increased amount of filtration and having a grade number of about 100 to about 300, a bulk density of about 1.70 to about 2.27 and an apparent porosity of about 39.0 to about 51.0%, said filter medium being prepared from starting materials comprising

a. 100 parts by weight of aggregate particles of at least one of fused alumina, sintered alumina, silicon carbide and silicon nitride,

b. 5 to 18 parts by weight of an inorganic bonding material having a chemical composition of about 10 to about 50% by weight of SiO_2 and about 5 to 20% by weight of B_2O_3, the chemical composition of said bonding material being such that a decrease in the viscosity of said bonding material does not occur at a temperature of 1100°C., or greater, at least 70% by weight of said bonding material

being a non-vitreous substance selected from the group consisting of talc, Gairome-Clay, calcined alumina, sintered alumina, aluminum hydroxide, boric acid, calcium carbonate, magnesium carbonate, wollastonite, siliceous sand and siliceous stone, and

c. 3–15 parts by weight of a combustible substance.

3,939,080

COMPOSITION FOR NEUTRALIZING STATIC ELECTRICITY

Edwin B. Martin, Greenville, S.C., assignor to Mar-Chem, Incorporated, Greenville, S.C.

Filed Oct. 10, 1973, Ser. No. 404,867

Int. Cl.² H05F *1/00*

U.S. Cl. 252—1 **5 Claims**

1. A composition for treating water recirculated in an air washer and characterized by having sufficient ionic activity to be effective for neutralizing static electricity in a room to which the air washer delivers a flow of air, the composition consisting essentially of about fifty percent by weight dodecylbenzyl-triethyl-ammonium chloride; water in such quantity as to constitute substantially the remainder of the composition; and from about four fluid ounces per gallon of the composition to about thirty fluid ounces per gallon of the composition of an additive selected from the group consisting of rust inhibiting agents and anti-foaming agents.

3,939,081

LOAD SUPPORTING LUBRICANT

Arnold O. DeHart, Rochester; Richard C. Rosenberg, Romeo, and Edward G. Trachman, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1975, Ser. No. 544,911

Int. Cl.² C10M *5/00, 7/00, 1/10, 3/02*

U.S. Cl. 252—12 **3 Claims**

1. A load supporting lubricant disposed between two slidably engageable surfaces consisting essentially of:

1. a binder fluid; and

2. a single layer of hard, uniformly sized spheres between the surfaces having a diameter in the range of from about ¼ mm to about 4,0 mm, dispersed through said fluid; each of said spheres being able to roll at random between said surfaces in engaging load supporting relationship therewith and through said binder fluid as one of said surfaces moves relative to the other.

2. A load bearing arrangement comprising slidably engageable surfaces having a load supporting medium disposed between the surfaces, said medium consisting essentially of:

1. from 20 to 80 percent by volume of a petroleum grease; and

2. the balance being a single layer of hard, uniformly sized spheres between the surfaces having a diameter in the range of from about ¼ mm to about 4.0 mm, dispersed through said fluid; each of said spheres being able to roll at random between said surfaces in engaging load supporting relationship therewith and through said binder fluid as one of said surfaces moves relative to the other.

3,939,082

SOAP THICKENED LUBRICANT COMPOSITION

Edward S. Williams, Claymont, Del.; William H. Reiland, West Chester, Pa., and John Q. Griffith, III, Claymont, Del., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 178,479, Sept. 7, 1971, Pat. No. 3,816,316, which is a continuation-in-part of Ser. No. 34,899, May 5, 1970, Pat. No. 3,694,363. This application June 10, 1974, Ser. No. 477,872. The portion of the term of this patent subsequent to Sept. 26, 1989, has been disclaimed.

Int. Cl.² C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—32.7 E **12 Claims**

1. A soap thickened lubricant comprising an effective amount, for thickening, of a lithium soap of a fatty acid or an aluminum soap of a fatty acid and a hydrocarbon base oil having a viscosity in the range of 80 to about 3,000 SUS at 100°F said base oil comprising at least one hydrorefined naphthenic oil or hydrocracked paraffin oil having a viscosity in the range of 40 to 12,000 SUS at 100°F.

5. A lubricant according to claim 4 and containing in the range of 0.0 to 1 percent lithium stearate, in the range of 0.02 to 2 percent neutral barium petroleum sulfonate and in the range of 0.1 to 5 percent zinc dialkyldithiophosphate.

3,939,083

TEXTILE-MACHINERY LUBRICANT COMPOSITION

Walter J. Coppock, Wallingford; James R. Amaroso, Newtown Square, both of Pa., and John Q. Griffith, III, Claymont, Del., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 240,806, April 4, 1972, Pat. No. 3,813,339. This application Feb. 7, 1974, Ser. No. 440,615. The portion of the term of this patent subsequent to May 28, 1991, has been disclaimed.

Int. Cl.² C10M *1/24*

U.S. Cl. 252—42 **10 Claims**

1. A high retention lubricant for textile-machinery, said lubricant comprising a base oil, an effective amount of a tackiness agent for retention in a bearing, and sufficient lithium soap to provide a MacMichael viscosity at 70°F in the range of 5 to 15, said base oil having a viscosity in the range of 60 to 600 SUS at 100°F, a 335 UVA in the range of 0.01 to 0.4, and an aniline point in the range of 150° to 170°F, and containing in the range of 85 to 100% of at least one hydrorefined naphthenic oil component having a viscosity in the range of 40 to 12,000 SUS at 100°F, said tackiness agent being selected from the group consisting of polyacrylates, aluminum oleate, olefin polymer, hydrogenated olefin polymer, mixtures of hydrogenated and unhydrogenated olefin polymer, and natural rubber obtained from dehydrated latex.

3,939,084

FUNCTIONAL FLUID COMPOSITIONS CONTAINING SUBSTITUTED PYRIMIDINES

James D. Sullivan, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 316,159, Dec. 18, 1972, abandoned, which is a continuation of Ser. No. 156,133, June 23, 1971, Pat. No. 3,759,829, which is a continuation-in-part of Ser. No. 796,885, Feb. 5, 1969, Pat. No. 3,591,500, which is a continuation-in-part of Ser. No. 540,488, April 6, 1966, abandoned. This application Dec. 28, 1973, Ser. No. 429,451

Int. Cl. C10m *3/32*

U.S. Cl. 252—47.5 **2 Claims**

1. Composition comprising

I. a major amount of a fluid of lubricating or hydraulic viscosity selected from the group consisting of

i. polyphenyl thioethers,

ii. mixed polyphenyl oxy-thioethers, and

iii. admixtures thereof, and

II. a corrosion inhibiting amount of 4-aminopyrazolo (3,4-d)pyrimidine.

2. Composition comprising

I. a major amount of a fluid of lubricating or hydraulic viscosity selected from the group consisting of

i. polyphenyl thioethers,

ii. mixed polyphenyl oxy-thioethers, and

iii. admixtures thereof, and

II. a corrosion inhibiting amount of 7-amino-1-v-triazolo-(d)pyrimidine.

3,939,085

PROCESS FOR FORMING A LIQUID DEVELOPER ORGANISOL

Ian Edward Smith, Lockleys; Peter John Hastwell, Elizabeth Grove, and Marinus Cornelus Vermeulen, Valley View, all of Australia, assignors to Savin Business Machines Corporation, Valhalla, N.Y.

Division of Ser. No. 155,108, June 21, 1971, Pat. No. 3,839,032. This application May 14, 1973, Ser. No. 359,650

Int. Cl.² G03G *9/00*

U.S. Cl. 252—62.12 **1 Claim**

1. A method of compounding a developing liquid for developing latent electrostatic images including the steps of forming an organosol comprising a solution of high molecular weight resin in a solvent having a kauri-butanol number in excess of 50, suspending said solution in a diluent having a kauri-butanol number of less than 30, forming a solution of a high molecular weight resin in a solvent having a kauri-butanol number greater than 50, milling said solution with a finely divided pigment having electrophoretic properties, suspending said pigment mix in a diluent having a kauri-butanol number of less than 30 and then mixing the high molecular weight resin suspension and the pigment suspension to form a developing liquid in which the pigment to resin ratios are between 1:11 and 1:1.

3,939,086

HIGHLY CLASSIFIED OXIDIZED DEVELOPER MATERIAL

Robert J. Hagenbach, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 369,036, June 11, 1973, Pat. No. 3,849,182, which is a continuation-in-part of Ser. No. 834,862, June 19, 1969, abandoned. This application July 18, 1974, Ser. No. 489,630

Int. Cl.² G03G *9/10*

U.S. Cl. 252—62.1 P **9 Claims**

1. An electrostatographic developer mixture consisting essentially of about one part by weight of finely-divided toner particles electrostatically adhering to the surface of about 10 parts to about 200 parts by weight of highly shape-classified low carbon hypereutectoid steel carrier particles having an average particle size between about 50 microns and about 1,000 microns and a specific gravity of at least about 7 grams per cubic centimeter, said steel carrier particles having been heat treated to a tempered martensitic microstructure with an average hardness of 40–55 Rockwell C in an air or oxygen atmosphere at temperatures ranging between about 500° and about 1,000°F to provide an oxide surface layer comprising Fe_3O_4 on said steel carrier material, said oxide surface layer having a thickness between about 0.2 and about 5.0 microns, said steel carrier particles comprising carrier cores having a composition comprising about 95.0 to about 99.0 parts iron, about 0.1 to about 2.0 parts carbon, about 0.5 to about 2.0 parts manganese, about 0.5 to about 2.0 parts silicon, about 0.03 to about 0.1 parts aluminum, about 0.01 to about 0.05 parts phosphorus, and about 0.02 to about 0.05 parts sulphur, said treated carrier particles being overcoated with a resinous coating material capable of electrostatically releasing said electrostatically adhering toner particles to an electrostatic latent image.

3,939,087

TONER COMPOSITIONS CONTAINING SILANE TREATED FUMED SILICA

Bheema R. Vijayendran, Bethel, and R. Clark DuBois, Fairfield, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 19, 1973, Ser. No. 416,936

Int. Cl.² G03G *9/04*

U.S. Cl. 252—61.1 L **8 Claims**

1. A hydrophobic, oleophilic liquid toner for use in a copier duplicator wherein an electrostatic image is created on a photoconductive layer, comprising: a concentrate having 0.1 to 12.0% pigment with a particle size not greater than 25 millimicrons, 10 40% polymer having a high affinity for the adsorption of said pigment, 40 to 65% hydrocarbon carrier having a K.B. number less than 30, a dielectric constant of less than 3.5, a resistivity of at least 10^9 ohm centimeters, and a TCC flash point of at least 100°F, said hydrocarbon carrier having a composition containing less than 2% aromatic liquid constituents and said polymer being soluble in said hydrocarbon carrier, and 1.0 to 12% silane treated fumed silica having a particle size of 5 to 15 millimicrons and a BET surface area of 100 to 400 m^2/gm, one part of said concentrate being dissolved in 4 to 50 parts by weight of said hydrocarbon carrier, said silane having some of the bonds of the silane linkage substituted by saturated or unsaturated hydrophobic organic groups.

3,939,088

FIRE-RESISTANT HYDRAULIC FLUID

Alfred Goldschmidt, El Cerrito, and Robert A. Stayner, Lafayette, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 25, 1974, Ser. No. 454,638

Int. Cl.² C09K *3/00*; C10M *1/06*, *1/28*

U.S. Cl. 252—79 HF **7 Claims**

1. A water-in-oil emulsion finding use as a functional fluid comprises from about 19 to about 50 weight percent of water, from about 80 to about 49 weight percent of mineral oil and in an amount sufficient to stabilize said water-in-oil emulsion a hydrocarbyl-substituted succinic acid monoester of a polyoxyethylene mono-ol of average molecular weight from about 200 to about 1,000 terminated with an alkyl group of 1 to 5 carbon atoms, wherein said hydrocarbyl substituent is of from about 750 to about 2,000 average molecular weight.

3,939,089

ETCHING SOLUTIONS FOR COPPER AND COPPER ALLOYS AND ETCHING PROCESS USING THE SAME

Akira Matsumoto, and Katsutoshi Itani, both of Fuji, Japan, assignors to Tokai Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,536

Claims priority, application Japan, Oct. 17, 1973, 48-115711

Int. Cl.² C09K *13/06*; C23F *1/00*

U.S. Cl. 252—79.4 **9 Claims**

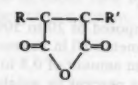
1. An etching solution for copper and copper alloys comprising an aqueous peroxysulfate solution containing from 5 percent by weight to its solubility limit therein of a peroxysulfate, from 10 parts per million to its solubility limit therein of a purine compound, and from 5 parts per million to 1,000 parts per million of a halogen compound which liberates halogen in an aqueous peroxysulfate solution.

3,939,090
ANTIFOGGING CLEANER

Barney J. Zmoda, Bridgewater Township, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,739
Int. Cl.² C11D 7/50
U.S. Cl. 252—90 11 Claims

1. A composition consisting essentially of approximately by weight, (a) 0.01 to 1.% of a copolymer derived from (1) an α, β - ethylenically unsaturated dicarboxylic acid anhydride having the general formula



wherein R and R′ are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, substituted alkyl, aryl and aralkyl and (2) an ethylenically unsaturated monomer selected from the group consisting of vinyl ethers, styrene, alpha-methyl styrene, lower alkyl substituted styrenes and lower olefins, up to 10% of at least one lower alkylene glycol; lower alkyl monoether, (c) up to 25% of a C_1-6 aliphatic alcohol, (d) 0.1 to 2.0% of an ethoxylated C_{10}-18 alkali metal or ammonium sulfate having about 2–200 units of ethylene oxide and the balance water, with the proviso that at least one of component (b) or (c) is present.

3,939,091
COMPOSITION FOR USE IN DEACIDIFICATION OF PAPER

George B. Kelly, Jr., Gaithersburg, Md., assignor to The United States of America as represented by the Librarian of Congress, Washington, D.C.

Filed Feb. 14, 1975, Ser. No. 550,087
Int. Cl.² C09K 3/30; A61L 13/00
U.S. Cl. 252—189 6 Claims

1. A composition for the deacidification of paper materials comprising 0.1 to 20% by weight of methyl magnesium carbonate in an organic solvent.

3,939,092
WATER WASHABLE DYE PENETRANT AND METHOD FOR UTILIZING SAME

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 444,433, Feb. 21, 1974. This application Nov. 7, 1974, Ser. No. 521,730
Int. Cl.² C09K 11/06; G01N 19/08, 21/16
U.S. Cl. 252—301.2 P 13 Claims

1. A water washable biodegradable liquid dye penetrant composition for use in non-destructive testing for detecting cracks and flaws in the surface of an object, which comprises (1) a major amount of a combination of biodegradable nonionic surfactants consisting of ethoxylates of linear secondary aliphatic alcohols, with the hydroxyl groups randomly distributed, the linear aliphatic portion of said alcohols being alkyl chains containing in the range from 11 to 15 carbon atoms, one of said biodegradable surfactants containing an average of 5 moles of ethylene oxide and another of said biodegradable surfactants containing an average of 9 moles of ethylene oxide; and (2) a small amount of a dye soluble in said combination of biodegradable surfactants.

2. A dye penetrant composition as defined in claim 1, wherein said ethoxylates of said alcohols forming said surfactants have the formula:

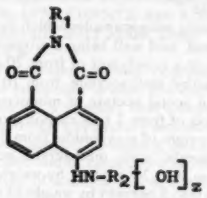
where n is in the range from 9 to 13, m for said one of said surfactants being 5, and m for said another of said surfactants being 9, and said dye is present in said composition in an amount ranging from about 0.1 to 15 parts, per 100 parts, by weight of the total combination of said surfacants, said composition being substantially non-flammable.

3,939,093
DAYLIGHT FLUORESCENT PIGMENTS

Theodor Papenfuhs, Frankfurt am Main; Ernst Spietschka, Oberauroff/Taunus, and Helmut Troster, Konigstein/-Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 6, 1974, Ser. No. 530,299
Claims priority, application Germany, Dec. 6, 1973, 2360787
Int. Cl.² C09K 11/06; C09D 11/00
U.S. Cl. 252—301.2 R 12 Claims

1. Daylight flurorescent pigments consisting essentially of a condensation resin and one or several compounds of the general formula (I)



in which R_1 stands for a substituted alkyl, cycloalkyl or aryl radical or a heterocyclic radical, R_2 stands for an alkylene radical which may be interrupted by heteroatoms, isocyclic or heterocyclic radicals, or which stands for a cycloalkylene radical whereby R_2 may be substituted by further non-ionic substituents, and z is 1, 2 or 3, the condensation resin being a melamine-formaldehyde resin which was obtained by condensation of melamine with formaldehyde or with agents yielding formaldehyde and with aryl sulfonic acid amides, aralkyl sulfonic acid amides or with both aryl sulfonic acid amides and aralkyl sulfonic acid amides.

3,939,094
COMPOSITIONS AND PROCESS FOR LIQUID SCINTILLATION COUNTING

Joel M. Kauffman, Sharon, Mass., assignor to New England Nuclear Corporation, Boston, Mass.

Filed Nov. 30, 1973, Ser. No. 420,633
Int. Cl.² G01T 1/167
U.S. Cl. 252—301.2 C 14 Claims

1. A liquid scintillation counting composition, comprising at least one solvent, a scintillating solute and a surface active agent, said surface active agent comprising a mixture of a first material having the following structural formula:

$$HO-[CH_2-CH_2-O]_x-[CH(CH_3)-CH_2-O]_y-[CH_2CH_2-O]_z-H$$

wherein y is from about 15 to 56, and x and z are from about 1 to 35, and a second, different material having the following structural formula:

$$HO-[CH_2-CH_2-O]_{x'}-[CH(CH_3)-CH_2-O]_{y'}-[CH_2CH_2O]_{z'}-H$$

wherein y' is from about 15 to 56, and x' and z' are from about 1 to 35.

3,939,095

DYE-CONTAINING MICROCAPSULES

Wolfgang Sliwka, Weinheim; Wolf-Ruediger Gaefke, and Tilmann Korth, both of Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 8, 1973, Ser. No. 386,526

Claims priority, application Germany, Aug. 10, 1972, 2239358

Int. Cl.² B01J *13/02*

U.S. Cl. 252—316 **6 Claims**

1. Dye containing microcapsules which comprise:

a. a capsule wall, said wall being a mixture of gelatine and gum arabic or a copolymer of from 20 to 65 percent by weight of methyl methacrylate, from 10 to 65 percent by weight of an acetyl acetate of mono(meth)-acrylates of aliphatic diols of from 2 to 8 carbon atoms, from 0 to 30 percent by weight of acrylamide, from 0 to 30 percent by weight of acrylic acid, methacrylic acid or a mixture thereof, from 0 to 30 percent by weight of vinyl pyrrolidone, from 0 to 3 percent by weight of vinylsulfonic acid or salts thereof, of 2-sulfoethyl methacrylate or salts thereof or of 2-acrylamido-2-methylpropane-sulfonic acid or salts thereof; and,

b. core material consisting essentially of at least one dye and a water immiscible organic liquid consisting essentially of at least one phenylindane mono- or disubstituted by linear or branched alkyl of from 1 to 6 carbon atoms.

3,939,096

SUPPORTED CATALYST FOR ACROLEIN OXIDATION

Peter C. Richardson, Morristown, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Sept. 24, 1974, Ser. No. 508,947

Int. Cl.² B01J *29/16*; C07C *51/24*

U.S. Cl. 252—456 **11 Claims**

1. An unagglomerated catalyst adapted for use in the catalytic conversion of a monoethylenically unsaturated acrylic aldehyde to the corresponding monoethylenically unsaturated acyclic carboxylic acid having the empirical formula $Mo_aV_bW_cMn_dO_e$, the atomic ratio of Mo:V:W:Mn:O being such that when a is 12, b is 0.5 to 12, c is 0.1 to 6, d is 0.5 to 20 and e is 37 to 94, contained on a porous silica support particle having a surface area of from about 25 to about 350 gm/m^2 and a porosity of from about 0.2 to about 1.0 cc/gm, the catalytic metals being contained essentially only on the surfaces of the particles.

3,939,097

EXHAUST GAS CLEANING CATALYSTS AND METHOD OF PRODUCING SAME

So Takeoka, Wako; Hideya Inaba, and Masayoshi Ichiki, both of Osaka, all of Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

Filed Dec. 6, 1973, Ser. No. 422,356

Claims priority, application Japan, Dec. 7, 1972, 47-122955; Dec. 7, 1972, 47-122956

Int. Cl.² B01J *21/04, 23/74, 23/84*

U.S. Cl. 252—464 **16 Claims**

1. A method of producing an exhaust gas cleaning catalyst comprising the steps of

forming an alloy composed of 20 to 50% by weight of Cu; at least one of the metals Ni in an amount of 1 to 20% by weight, and Cr in an amount of 0.5 to 8% by weight; and Al as the remaining percent by weight;

adding at least one additional metal selected from the group consisting of V, Mn, Fe, Co, Nb, Mo, Ru, Rh and Pd; and

eluting Al from the surface of said alloy to activate the surface of said catalyst.

3,939,098

SUSPENSION FOR DEPOSITING A PYROELECTRIC MATERIAL

Robert Dean Larrabee, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 24, 1973, Ser. No. 363,669

Int. Cl.² H01B *1/06*

U.S. Cl. 252—518 **4 Claims**

1. A suspension having improved stability comprising a mixture of an alcohol having one to five carbon atoms and glycine and a pyroelectric particulate material selected from the group consisting of triglycine sulfate, triglycine selenate and triglycine fluoroberyllate suspended in said mixture.

3,939,099

FRAGRANCE COMPOSITION

Philip Tusa, Madison, and Frank Tranner, Trumbull, both of Conn., assignors to Chesebrough-Pond's, Inc., Greenwich, Conn.

Filed Dec. 26, 1974, Ser. No. 536,396

Int. Cl.² A61K *2/46*; C11B *9/00*

U.S. Cl. 252—522 **10 Claims**

1. A fragrance composition having an adequate odor strength when initially applied to the human skin and which odor strength is continued for a long period of time after application comprising a fragrance oil and a film former mutually soluble in a water-ethanol solvent system, the film-former being in an amount of 0.01 to 20.0% by weight of the total weight of the film-former, fragrance oil and water-ethanol solvent components, the fragrance oil being in an amount of 0.01 to 50.0% by weight of the total weight of the film-former, fragrance oil and waterethanol solvent components, the water-ethanol solvent being in an amount of 30.0 to 99.98% by weight of the total weight of the fragrance oil, film-former and water-ethanol solvent components, the water being in an amount of 1.0 to 59.8% by weight of the water-ethanol solvent.

3,939,100

COMBINATION ALKALI METAL PYROPHOSPHATE-ALKALINE EARTH METAL PYROPHOSPHATE DETERGENT BUILDER

Thomas J. Hau, Cincinnati, and Steven D. Cherney, Springdale, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 14, 1975, Ser. No. 550,055

Int. Cl.² C02B *1/22*; C11D *3/04, 3/12, 9/18*

U.S. Cl. 252—532 **19 Claims**

1. A detergent additive comprising:

a. an alkali metal pyrophosphate; and
b. an alkaline earth metal pyrophosphate having
a mean particle diameter of less than 25 microns; in a weight ratio of the alkali metal pyrophosphate to the alkaline earth metal pyrophosphate of from about 60:1 to about 1:8.

9. A detergent composition comprising:
a. from about 5% to about 60% by weight of an alkali metal pyrophosphate;
b. from about 1% to about 50% by weight of an alkaline earth metal pyrophosphate having a mean particle diameter of less than 25 microns and
c. from about 2% to about 40% by weight of an organic detergent surfactant component.

3,939,101

COMPOSITION FOR ULTRASONIC INSPECTION OF OBJECTS AND METHOD FOR EMPLOYING SAME

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 295,059, Oct. 4, 1972, Pat. No. 3,826,127. This application Feb. 21, 1974, Ser. No. 444,213
Int. Cl.² G01N *29/04*; C09K *3/00*
U.S. Cl. 252—408 R **16 Claims**

1. A composition for ultrasonic inspection of surface and subsurface flaws and discontinuities, comprising an aqueous gel containing an N-alkyl-2-pyrrolidone wherein the alkyl group contains from 1 to 4 carbon atoms, a water soluble surfactant and silica suspended in said gel.

3,939,102

HYDROCARBON ISOMERIZATION CATALYST AND PROCESS

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 365,782, May 31, 1973, Pat. No. 3,839,193, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Mar. 29, 1974, Ser. No. 456,705. The portion of the term of this patent subsequent to Oct. 1, 1991, has been disclaimed.
Int. Cl.² B01J *27/04*, *27/08*, *27/10*
U.S. Cl. 252—439 **9 Claims**

1. A catalytic composite consisting essentially of a refractory inorganic oxide having combined therewith, on a Friedel-Crafts metal halide-free basis, about 0.01 to about 2 weight percent platinum or palladium, about 0.01 to about 2 weight percent iridium, about 0.01 to about 5 weight percent germanium, and about 0.1 to about 3.5 weight percent halogen in halide form, calculated on an elemental basis, and about 1.0 to about 100 weight percent Friedel-Crafts metal halide, wherein the platinum or palladium, iridium and germanium are uniformly dispersed throughout the refractory inorganic oxide, wherein substantially all of the platinum or palladium and iridium are present in the corresponding metallic states and wherein substantially all of the germanium is present in the form of the oxide, sulfide, halide, oxychloride or aluminate.

3,939,103

CATALYTIC PRODUCT FOR THE OXIDATIVE DESTRUCTION OF GASEOUS ORGANIC COMPOUNDS AND METHOD FOR THEIR PREPARATION

Christian Belliot; Etienne Cheylan; Serge Madelaine, and Johannes Ebbing, all of Paris, France, assignors to Compagnie Francaise Thomson Houston-Hotchkiss Brandt, Paris, France

Division of Ser. No. 203,833, Dec. 1, 1971, abandoned. This application July 19, 1973, Ser. No. 380,721
Claims priority, application France, Dec. 1, 1970, 70.43189
Int. Cl.² B01J *29/06*, *29/34*
U.S. Cl. 252—455 R **15 Claims**

1. A catalyst for the oxidative destruction of gaseous organic compounds, which comprises between about 80 and about 50% of total catalyst weight of active ingredients and from about 20 to about 50% of total catalyst weight of a cold-shapable refractory excipient, wherein the active ingredients comprises from about 50% to about 85% by weight of rhombohedral manganese oxides, from 0 to about 30% by weight of manganous carbonate, from about 3 to about 10% by weight of cupric oxide, and from 0 to about 15% by weight of nickel oxides.

3,939,104

CATALYTIC PROCESS

John Stewart Campbell; Keith Farmery; David John Heath, and Norman Henry Harbord, all of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 2, 1973, Ser. No. 402,779
Claims priority, application United Kingdom, Oct. 4, 1972, 45696/72; Nov. 20, 1972, 53493/72; Apr. 5, 1973, 16288/73
Int. Cl.² B01J *29/06*, *29/00*
U.S. Cl. 252—455 R **18 Claims**

1. A catalyst for treating internal combustion engine exhaust gases which comprises at least one non-noble metal or compound thereof on a support that comprises a primary catalyst support carrying a refractory secondary catalyst support, the secondary support consisting essentially of one or more involatile acidic and/or amphoteric oxides selected from the group consisting of alumina, silica, chromia, manganese oxide, iron oxide and mixtures or compounds thereof substantially in combination with one or more basic oxides from the group consisting of calcium, strontium and barium wherein at least 70% by weight of said acidic and/or amphoteric oxide is in combination with said basic oxides and said one or more basic oxides is present in a quantity that will give a stoichiometric compound with said acidic and/or amphoteric compound.

3,939,105

MICROPOROUS POLYURETHANE HYDROGELS, METHOD AND COMPOSITES WITH NATURAL AND OTHER SYNTHETIC FIBERS OR FILMS

Allen Paul Jones, Jr., Charleston; Robert John Knopf, St. Albans, and Claude Milton Conner, Nitro, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 18, 1974, Ser. No. 480,567
Int. Cl.² C08G *18/14*
U.S. Cl. 260—2.5 AY **33 Claims**

1. An article of manufacture comprising a composite of (I) a shaped microporous, water swellable, lightly crosslinked, hydrogel polymer article of the isocyanato terminated prepolymer comprising the reaction product of:
i. a poly(alkyleneoxy) polyol having an average molecular weight up to about 25,000 wherein the alkyleneoxy group contains from 2 to 4 carbon atoms, and
ii. an organic diisocyanate, said prepolymer impregnated with a minor significant amount of a liquid non-solvent prior to lightly crosslinking thereof with an equivalent amount of a crosslinking agent of the group:

iii. water or organic polyamine; wherein said poly(alkyleneoxy) polyol is a mixture of a major amount of a poly(ethyleneoxy) diol having an average molecular weight of from about 4,000 to about 25,000 and a minor amount of a higher polyol of the group poly(alkyleneoxy) triol or poly(alkyleneoxy) tetrol having from 2 to 4 carbon atoms in the alkyleneoxy group or aliphatic polyhydroxyl compound of the formula $C_nH_{2n+2-m}(OH)_m$ wherein n has a value of 3 to 6 and m has a value of 3 to 4, or mixtures thereof, said triol or tetrol having an average molecular weight of from about 92 to 5,000, wherein the mole ratio of diol to higher polyol in said mixture is from about 6:1 to 40:1; wherein the equivalents ratio of isocyanato groups to hydroxyl groups is from about 1.2:1 to about 1.6:1; wherein the organic polyamine is a primary or secondary diamine or triamine and wherein the equivalents of reactive crosslinking groups in said crosslinking agent used is equivalent to the number of equivalents of isocyanato groups present in said prepolymer; in combination with (II) a natural or a different synthetic fiber or film.

3,939,106

ENERGY ABSORBING POLYURETHANE-POLYUREA CELLULAR ELASTOMERS

Raymond A. Dunleavy, and Leslie E. Hawker, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 20, 1973, Ser. No. 343,180
Int. Cl.² C08G *18/14, 18/32, 18/48*
U.S. Cl. 260—2.5 AM **4 Claims**

1. A process for producing a cellular polyurethane-polyurea elastomer useful as the energy absorbing component in automobile bumpers which process comprises forming and curing a reaction mixture consisting essentially of:

a. a polymer polyol comprising a liquid polyoxyalkylene polyol that has a molecular weight of at least 1500 and a hydroxyl number from 20 to 120 and that contains therein film-forming organic polymer having a molecular weight of at least 5000, said polymer polyol consisting essentially of from 85 to 60 parts by weight of the polyol and from 15 to 40 parts by weight of the polymer per 100 parts by weight of the polymer polyol and said polymer having been produced polymerizing in said polyol at least one monomer selected from the group consisting of hydrocarbon olefins, olefinic nitriles, alkenyl esters of alkanoic acids, alkyl acrylates, alkyl methacrylates and unsaturated aliphatic acids;

b. an aromatic polyamine having at least two primary amine groups attached to carbon atoms of the same or different aromatic rings, at least one of such carbon atoms being adjacent to a carbon atom having a chlorine substituent and each such aromatic ring consisting of carbon and hydrogen;

c. an aromatic glycol, said glycol being the reaction product of an alkylene oxide with an aromatic amine consisting of carbon, hydrogen and nitrogen, said nitrogen being in an amino group, and said aromatic amine having two active hydrogens provided by the amino group or an aromatic alcohol consisting of carbon, hydrogen and oxygen, said oxygen being in hydroxyl groups, and said alcohol having two active hydrogens; provided by the hydroxyl groups;

d. an organic polyisocyanate in an amount that provides from 0.8 to 1.3 isocyanato groups per active-hydrogen group in the reaction mixture;

e. a catalytic amount of catalyst for the curing of the reaction mixture to produce the elastomer; and

f. a blowing agent in an amount sufficient to produce a cellular structure in the elastomer,

said reaction mixture containing from 97 to 65 parts by weight of (a) and 3 to 35 parts by weight of (b) per 100 parts by weight of (a) and (b) and said reaction mixture containing from 1 to 35 parts by weight of (c) per 100 parts by weight of (a) and (c), with the proviso that the reaction mixture contains no more than 35 parts by weight of (b) and (c) per 100 parts by weight of (a), (b) and (c).

2. An elastomer produced by the process of claim 1.

3,939,107

FIRE-RETARDANT PARTICLE BOARD AND BINDER THEREFOR FROM AMINOPLAST WITH AMMONIUM POLYPHOSPHATE-FORMALDEHYDE PRODUCT

Gordon E. Brown, Eugene, Oreg., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 6, 1974, Ser. No. 503,890
Int. Cl.² C08L *1/00, 61/24, 61/34*
U.S. Cl. 260—17.3 **15 Claims**

1. A fire retardant aminoplast binder resin solution containing not more than 30 percent by weight water consisting of

A. a substantially neutral aqueous solution of a low molecular weight urea-formaldehyde resin of a mol ratio of from about 3.0 to 3.5 formaldehyde to urea, a viscosity of from about 60 to 100 cps and a percent solids of at least 70 percent,

B. sufficient urea to reduce the formaldehyde to urea ratio to from about 1.2 to 2.0, and

C. a stable concentrated aqueous solution having a percent solids of at least 55 percent of ammonium polyphosphate reacted with from 5 to 12.5 percent by weight formaldehyde adjusted to a pH of from 4.7 to 6.2 to produce a concentration of dissolved ammonium polyphosphate of from about 40 to 56 percent by weight in said binder resin solution.

3,939,108

COLD WATER RESISTANT STARCH-BASED ADHESIVE CONTAINING STYRENE-MALEIC ANHYDRIDE RESIN AND FIXED ALKALI

Julius Sirota, South Plainfield, and Matthew P. McKenna, Jr., Flemington, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Dec. 16, 1974, Ser. No. 532,930
Int. Cl.² C08L *3/00*
U.S. Cl. 260—17.4 ST **8 Claims**

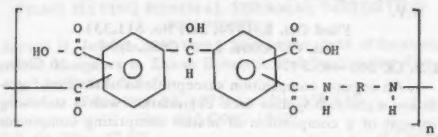
1. A cold water resistant adhesive composition comprising a mixture of starch, at least one styrene maleic anhydride copolymer having a styrene to maleic anhydride ratio of 1:1 to 3:1, a peptizer, water and sufficient alkali to give a pH within the range of 8.0 to 11.0 with at least 20% of the total alkali, on a stoichiometric equivalent basis, of a 100% fixed alkali product, employed in the form of a fixed alkali, said composition containing 4.8 to 20.0 parts sytrene maleic anhydride per 100 parts starch.

3,939,109
POLYAMIC-ACIDS PREPARED FROM 3,3,4,4-BENZHYDROL TETRACARBOXYLIC DIANHYDRIDE

Walter P. Barie, Jr., Shaler Township; Anatoli Onopchenko, Monroeville, and Johann G. D. Schulz, Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 19, 1974, Ser. No. 534,230
Int. Cl.² C08G *73/10*
U.S. Cl. 260—29.1 R **7 Claims**

1. A polyamic acid having the general formula



where the carbonyl groups are independently in the 3-, 4- and 3'-, 4'- positions respectively, wherein *n* is greater than about 10 up to about 1000 and R is a divalent organic radical having at least two carbon atoms with each nitrogen atom chemically bonded to different carbon atoms of said R radical.

3,939,110
AQUEOUS POLYELECTROLYTIC ELECTROCOATING MATERIALS OF ORGANIC RESINS

Kenneth Herman Colberg, Arlington Heights, and Ronald Joseph Zukowski, Buffalo Grove, both of Ill., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 297,419, Oct. 13, 1972, Pat. No. 3,784,093. This application Jan. 2, 1974, Ser. No. 430,053
Int. Cl.² C08L *33/02*; C09D *5/40*
U.S. Cl. 260—29.6 ME **3 Claims**

1. An aqueous polyelectrolytic electrocoating concentrate dispersable in water to form a bath used in contact with an anode and a cathode in an electric circuit of an electrocoating process for electrocoating a metal substrate, which comprises from about 20 to 60 weight percent synthetic polycarboxylic acid resin solids based on the concentrate, said solids being soluble in alcohols haivng from 1 to 5 carbon atoms, and having from 50 to 85 percent of their reactive sites neutralized with a sufficient quantity of water soluble amino compound to maintain the polycarboxylic acid resin solids as a dispersion of anionic polyelectrolyte in the concentrate, and

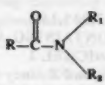
a monohydric alcohol having from 1 to 5 carbon atoms selected from the group consisting of methanol, ethanol, propanol, isopropanol, n-butanol, isobutanol, sec-butanol, tert-butanol, amyl alcohol and isoamyl alcohol, said alcohol being at least partly associated with and dispersed in the resin concentrate in an amount of from 2.0 to 20 weight percent based on the weight of the resin solids, the presence of said alcohol being to at least maintain the resistivity and increase the throwing and wetting power of the medium bath, and to provide a higher quality, more pliable coating which releases more vapors from and leaves less voids in the coating upon curing than if said monohydric alcohol were not present in the concentrate.

3,939,111
STABLE POLYURETHANE SOLUTIONS

Charles S. Schollenberger, Hudson, and Kornelius Dinbergs, Broadview Heights, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed July 1, 1974, Ser. No. 484,396
Int. Cl.² C08K *3/28, 5/20*
U.S. Cl. 260—32.6 NR **7 Claims**

1. A solution of polyurethane in a solvent having the general formula



wherein the R's are hydrogen or alkyl containing a viscosity stabilizing amount of about 0.01 to about 2% of an ammonium salt of an inorganic acid selected from the group consisting of ammonium chloride, ammonium nitrate, and ammonium sulfate.

3,939,112
THERMOPLASTIC RESIN COMPOSITION HAVING HIGH IMPACT STRENGTH

Donald G. Needham, Ramona, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 18, 1974, Ser. No. 524,887
Int. Cl.² C08K *5/01*; C08L *9/06*
U.S. Cl. 260—33.6 AQ **9 Claims**

1. A composition consisting essentially of

a. a polymodal radial brached block copolymer of the general formula
$(A-B)_xY$
wherein *A* is essentially a block of polymerized monovinyl-substituted aromatic monomers of 8 to about 16 carbon atoms; *B* is essentially a polymerized conjugated alkadiene block, the alkadiene having 4 to about 12 carbon atoms; *Y* is an atom or group of atoms derived from a polyfunctional coupling agent; and *x* represents the number of functional groups of said polyfunctional coupling agent, and

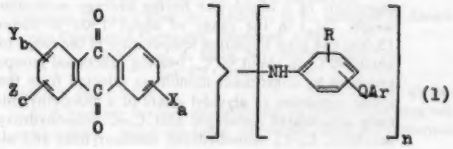
b. an amount of a naphthenic extender oil which increases the impact strength.

3,939,113
PROCESS FOR THE BULK DYEING OF POLYESTERS

Arnold Wick, Therwil, and Max Jost, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 29, 1974, Ser. No. 492,629
Claims priority, application Switzerland, Aug. 2, 1973, 11224/73
Int. Cl.² C08L *67/00*
U.S. Cl. 260—40 P **8 Claims**

1. Process for the bulk dyeing of polyesters, characterised in that the dyestuffs used are anthraquinone derivatives of the formula



wherein Q denotes one of the bridge members —O— or —CO—, R denotes hydrogen or an alkyl group containing 1–4 carbon atoms, Ar denotes an aryl group, *n* denotes a number from 1 to 4, X, Y and Z denote an amino, hydroxyl, alkoxy, aryloxy, alkylmercapto, arylmercapto, arylamino or aroylamino group or halogen and *a*, *b* and *c* each denote zero or a number from 1 to 4, with the sum of *n+a+b+c* being a number from 1 to 6.

3,939,114
POWDER PAINTS CONTAINING ALUMINUM AND NICKEL I

Melville J. Camelon, Utica, and Rodney C. Gibeau, Mt. Clemens, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 422,473, Dec. 6, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,487

Int. Cl.² C08K *3/08, 9/04, 9/10*

U.S. Cl. 260—42.14 **16 Claims**

1. In a powder paint which exclusive of catalysts, antistatic agents, plasticizers, and flow control agents, the same being known and optional additives to powder paints, consists essentially of aluminum flakes, non-metal pigment, and a particulate, organic, film-former, the improvement wherein

A. said non-metal pigment comprises 0 to about 22 weight percent of said powder paint,

B. said aluminum flakes comprise about 0.005 to about 25 weight percent of said powder paint and are encapsulated prior to admixture with said particulate, organic, film-former with about 2 to about 200 parts by weight of a continuous coating of a thermosettable, organic, film-former per 100 parts by weight aluminum flakes, said thermosettable, organic, film-former consisting essentially of a copolymer having average molecular weight (M_n) in the range of about 1500 to about 15,000 and glass transition temperature in the range of about 40°C. to about 90°C. bearing functional groups provided by constituent monomers selected from the group consisting of glycidyl esters of a monoethylenically unsaturated carboxylic acid, C_5–C_7 monohydroxy acrylates, C_5–C_7 monohydroxy methacrylates and alpha-beta olefinically unsaturated amides and wherein at least above 50 weight percent of the constituent monomers are selected from acrylic monomers and the remainder weight percent, if any, of the constituent monomers consist essentially of C_8–C_{12} monovinyl hydrocarbons, said copolymer being self-crosslinkable or employed in combination with a monomeric or polymeric crosslinking agent that is capable of reacting with said functional groups on said copolymer.

C. nickel powder is dispersed in said powder paint, the weight ratio of said nickel powder to the encapsulated aluminum flakes being between about 1:4 and about 5:1, and

D. said particulate, organic film-former is selected from

1. a thermoplastic, particulate, film-former that is a polymer of alpha-beta olefinically unsaturated monomers of which about 51 to about 100 weight percent are acrylic monomers and 0 to about 49 weight percent are monovinyl hydrocarbons, and

2. thermosettable, particulate, film-formers consisting essentially of a copolymer having average molecular weight (M_n) in the range of about 1500 to about 15,000 and glass transition temperature in the range of about 40°C. to about 90°C., bearing functional groups provided by constituent monomers selected from the group consisting of glycidyl esters of a monoethylenically unsaturated carboxylic acid, C_5–C_7 monohydroxy acrylates, C_5–C_7 monohydroxy methacrylates and alpha-beta olefinically unsaturated amides and wherein at least about 50 weight percent of the constituent monomers are selected from acrylic monomers and the remainder weight percent, if any, of the constituent monomers consist essentially of C_8–C_{12} monovinyl hydrocarbons, said copolymer being self-crosslinkable or employed in combination with a monomeric or polymeric cross-linking agent that is capable of reactions with said functional groups on said copolymer.

3,939,115
POLYCHROMOPHORIC ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Richard H. S. Wang, and Gether Irick, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

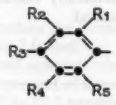
Filed Oct. 2, 1974, Ser. No. 511,331

Int. Cl.² C08K *5/00;* **C08L** *5/00*

U.S. Cl. 260—45.8 N **30 Claims**

1. An organic composition susceptible to ultraviolet degradation stabilized against such degradation with a stabilizing amount of a composition of matter comprising compounds having the formula:

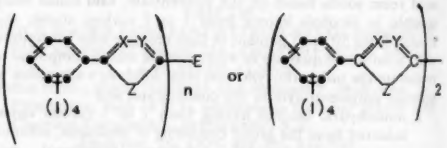
wherein A is a group having the structure:



wherein

R_1, R_2, R_3, R_4 and R_5 are hydrogen, hydroxy, chloro, bromo, fluoro, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, alkoxy, aryloxy, amino, substituted amino, cyano, carboalkoxy and the substituents R_1 and R_2, R_2 and R_3, R_3 and R_4, and R_4 and R_5 combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3, R_4 and R_5;

B is a heterocyclic group having the structures



wherein

X and Y are a carbon atom, a carbon atom containing an alkyl group having 1 to 12 carbon atoms, a carbon atom containing an aryl group having 6 to 18 carbon atoms or a nitrogen atom; Z is an oxygen atom, a sulfur atom, or a nitrogen atom containing a hydrogen atom or a substituted or unsubstituted lower alkyl group having 1 to 12

carbon atoms; I is hydrogen, chloro, bromo, fluoro, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, arylsubstituted-aryl, alkoxy, aryloxy, substituted amino and cyano, said I is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the carbonyloxy or oxycarbonyl group, E is a substituted or unsubstituted alkylene and arylene and n is an integer from 1 to 6 wherein at least one of R_1, R_5 or I ortho to the oxy of said carbonyloxy or oxycarbonyl group is hydrogen.

3,939,116

SELF-SUPPORTED, ORIENTED HIGH-PERFORMANCE FILMS HAVING MINIMAL THERMAL DISTORTION PROPERTIES

Burnett H. Johnson, and Don J. Henderson, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed May 14, 1973, Ser. No. 359,836
Int. Cl.² C08G *18/00*
U.S. Cl. 260—47 CB **9 Claims**

1. An oriented shaped article formed from a high softening temperature aromatic-containing polymer or copolymer having a thermal co-efficient of expansion (α) of from +1.6 to -3.0×10^{-5} deg $^{-1}$ and for PPA a birefringence value of from 0.05 to 0.2 and wherein said article has been elongated at least 25% more than its non-oriented value in one dimension.

3,939,117

PROCESS FOR PRODUCING A POLYARYLENE ESTER

Katsuji Ueno, Hirakata, Japan, assignor to Sumitomo Chemical Company, Limited, Japan

Filed May 31, 1974, Ser. No. 475,181
Claims priority, application Japan, May 31, 1973, 48-61533
Int. Cl.² C08G *63/40*
U.S. Cl. 260—47 C **13 Claims**

1. A process for producing a polyarylene ester, which comprises subjecting to a polymerization reaction at a temperature of 0° to 100° C, in the presence of a polymerization catalyst selected from the group consisting of a tertiary amine, a quaternary ammonium compound and a quaternary phosphonium compound, a slurry of at least one divalent phenol, at least one aromatic carboxyl dichloride, and calcium hydroxide in the form of solid particles, said polymerization catalyst being used in an amount of 0.001 to about 5 molar % based on the amount of the divalent phenol and said calcium hydroxide being present in an amount of at least 1.5 mol per one mol of said divalent phenol, in an inert organic liquid which is a solvent for the polyarylene ester but not a solvent for the calcium hydroxide to give a reaction mixture consisting of a solid phase and a single liquid phase containing the polyarylene ester dissolved in the inert organic liquid, and then separating the liquid phase from the solid phase.

3,939,118

PROCESS FOR REMOVING CONTAMINANTS FROM POLYCARBONATE SOLUTIONS

Alfred Horbach, Krefeld, and Hugo Vernaleken, Krefeld-Bockum, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 24, 1974, Ser. No. 508,948
Claims priority, application Germany, Oct. 6, 1973, 2350327
Int. Cl.² C08G *63/74, 63/62*
U.S. Cl. 260—47 XA **13 Claims**

1. A process for removing inorganic compounds from polycarbonate solutions which comprises contacting a polycarbonate solution with a molecular sieve which is moist with water.

3,939,119

AROMATIC POLYETHER-POLYTHIOETHER-POLYSULFONE THERMOPLASTICS

Francis X. O'Shea, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed May 27, 1971, Ser. No. 147,599
Int. Cl.² C08G *65/40*
U.S. Cl. 260—49 **8 Claims**

1. Thermoplastic high polymers consisting essentially of the structure

$$+R+C_6H_4-SO_2-C_6H_4+_y+_n,$$

wherein y is 1 or 2, n is an integer from about 30 to 60, R is a mixture of —O—R′—S— and —S—R′—O—, and R′ is selected from the group consisting of phenylene, methylphenylene and dimethylphenylene groups.

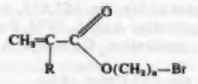
3,939,120

ACRYLONITRILE COPOLYMERS SUITABLE FOR MAKING FLAME-RESISTING FIBERS

Luciano Console, Mirano-Venezia; Ferdinando Bencini, San Donato Milanese, Milan, and Enzo Chiellini, Rosignano Solvay, Livorno, all of Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

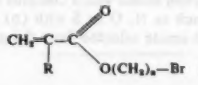
Filed Nov. 25, 1974, Ser. No. 527,097
Claims priority, application Italy, Nov. 28, 1973, 31752/73
Int. Cl.² C08F *214/16, 216/14;* C08L *27/10;* C08K *5/20*
U.S. Cl. 260—63 HA **10 Claims**

1. A copolymer suitable for making self-extinguishing fibers, consisting essentially of the following comonomers: at least 50 wt.% acrylonitrile, from 2 to 30 wt.% of vinyl or vinylidene chloride, from 0 to 10 wt.% of a neutral, ethylenically unsaturated, non-halogenated monomer and from 2 to 40 wt.% of a monomer selected from the group corresponding to the general formula:



wherein R is selected from the group of hydrogen and methyl and n is an integer from 1 to 4.

3. A copolymer suitable for making self-extinguishing fibers, consisting essentially of the following comonomers: at least 50 wt.% acrylonitrile, from 2 to 30 wt.% of vinyl or vinylidene chloride, from 0 to 10 wt.% of a neutral, ethylenically unsaturated, non-halogenated monomer; from 0.1 to 3 wt.% of a copolymerized monomer carrying sulphonic groups, and from 2 to 40 wt.% of a monomer selected from the group corresponding to the general formula:



wherein R is selected from the group of hydrogen and methyl and n is an integer from 1 to 4.

3,939,121

THERMOSETTING TOLUENE-SOLUBLE WATER-INSOLUBLE ALKYLATED UREA-FORMALDEHYDE RESIN AND PROCESS FOR THE MANUFACTURE THEREOF

Leonard Joseph Calbo, Jr., Ardsley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 4, 1974, Ser. No. 430,802
Int. Cl.² C08G *14/02*
U.S. Cl. 260—70 A **17 Claims**

6. A process for the manufacture of a thermosetting toluene-soluble water-insoluble alkylated urea-formaldehyde

resin according to claim 1, which consists essentially in the following steps:

1. reacting 1 mol of urea with about 2.3 to 2.7 mols of formaldehyde at a non-acid pH in aqueous solution;
2. concentrating the reaction product to at least 50% solids;
3. adding to the residue an excess of a non-tertiary C_{4-6} alkanol or mixture of non-tertiary C_{4-6} alkanols in stoichiometric excess;
4. maintaining the resulting solution at a predetermined pH below 7 and at a predetermined temperature between 20°C. and reflux at which combination of pH and temperature alkylation of said reaction product proceeds rapidly and polymerization of said reaction product proceeds slowly, whereby a urea-formaldehyde resin is obtained at least 30% of the methylol groups of which are alkylated and which has a number average molecular weight between 350 and 700;
5. concentrating the reaction product to at least 80% solids;
6. adding to the residue said alkanol or a mixture of said alkanols in stoichiometric excess;
7. acidifying the resulting solution to a pH below about 2;
8. maintaining the solution at about 25°C. to 55°C. until the reaction product contains between about 1.3 and 1.8 mol of said C_{4-6} alkanol or mixture of said alkanols and until it contains 0.3 to 0.7 mol of methylol substituents per mol of combined urea present; and
9. raising the pH of the solution about 7.

3,939,122
PROCESS FOR THE PREPARATION OF COMPOUNDS WHICH CONTAIN HYDANTOIN RINGS

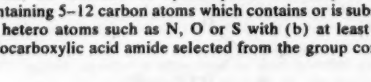
Rudolf Merten, Leverkusen; Jurgen Lewalter, Cologne, and Wilfried Zecher, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 457,853, April 4, 1974, abandoned. This application Aug. 1, 1974, Ser. No. 493,521
Claims priority, application Germany, Apr. 11, 1973, 2318205
Int. Cl.² C08G *18/08*
U.S. Cl. 260—77.5 R **10 Claims**

1. A process for the preparation of a compound containing hydantoin groups which comprises reacting at a temperature of 50° to 350°C. at least one compound of the formula

$$R^3(\text{-}NCX)_z$$

wherein X is O or S; z is an integer of from 2 to 3 and R^3 is an optionally substituted aliphatic radical having 1–20 carbon atoms, an optionally substituted aromatic radical having 5–12 carbon atoms, a cycloaliphatic radical having 5–12 carbon atoms, an aliphatic-aromatic radical having 6–20 carbon atoms, an aromatic or cycloaliphatic heterocyclic radical containing 5–12 carbon atoms which contains or is substituted by hetero atoms such as N, O or S with (b) at least one α-halocarboxylic acid amide selected from the group consisting of



wherein Hal denotes halogen; R^4 is an optionally substituted aromatic radical having 5–10 carbon atoms, an aliphatic radical having 1–20 carbon atoms, a cycloaliphatic radical having 5–10 carbon atoms, hydrogen or the two radicals R^4 taken together with the carbon atom to which they are attached form a cycloaliphatic ring of 5–7 ring members, R^5 is one of the radicals defining R^3; R^6 is an aliphatic radical having 1–10 carbon atoms, a cycloaliphatic radical having 5–10 carbon atoms, an aliphatic-aromatic radical having 6–10 carbon atoms or an aromatic radical having 5–10 carbon atoms and *x* and *y* are integers from 2 to 3.

3,939,123
LIGHTLY CROSS-LINKED POLYURETHANE HYDROGELS BASED ON POLY(ALKYLENE ETHER) POLYOLS

Virgil Edison Matthews, Charleston, and Robert John Knopf, Saint Albans, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 18, 1974, Ser. No. 480,568
Int. Cl.² C08G *18/66, 18/14*
U.S. Cl. 260—77.5 AM **45 Claims**

1. A water swellable, lightly crosslinked, hydrogel polymer of the isocyanato terminated prepolymer comprising the reaction product of:

i. a poly(alkyleneoxy) polyol having an average molecular weight up to about 25,000 wherein the alkyleneoxy group contains from two to four carbon atoms, and

ii. an organic diisocyanate,

said prepolymer lightly crosslinked with an equivalent amount of a crosslinking agent of the group:

iii. water or organic polyamine;

wherein said poly(alkyleneoxy) polyol is a mixture of a major amount of a poly(ethyleneoxy) diol having an average molecular weight of from about 4,000 to about 25,000, and a minor amount of a higher polyol of the group poly(alkyleneoxy) triol or poly(alkyleneoxy) tetrol or aliphatic polyhydroxyl compound of the formula $C_nH_{2n+2-m}(OH)_m$ wherein *n* has a value of 3 to 6 and *m* has a value of 3 to 4, or mixtures thereof, said triol or tetrol having an average molecular weight of from about 92 to 5,000, wherein the mole ratio of diol to higher polyol in said mixture is from about 6:1 to 40:1; wherein the equivalents ratio of isocyanato groups to hydroxyl groups is from about 1.2:1 to about 1.6:1; wherein the organic polyamine is a primary or secondary diamine or triamine; and wherein the equivalents of reactive crosslinking groups in said crosslinking agent used is equivalent to the number of equivalents of isocyanato groups present in said prepolymer.

3,939,124
FIRE-RETARDANT POLYURETHANE RESINS PREPARED FROM SIDE-CHAIN HALOGENATED AROMATIC POLYISOCYANATES

Eugene P. DiBella, Piscataway, and Bernard Rudner, Ridgewood, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Sept. 9, 1974, Ser. No. 504,401
Int. Cl.² C08G *18/76*
U.S. Cl. 260—77.5 AT **5 Claims**

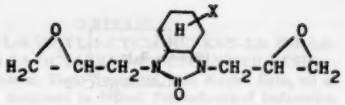
1. A fire-retardant polyurethane resin that comprises the reaction product of a polyisocyanate component containing from about 30% to 80% by weight of a side-chain halogenated aromatic polyisocyanate selected from the group consisting of 2,4-diisocyanatobenzotrichloride, 2,6-diisocyanatobenzotrichloride, and mixtures thereof and a polyol having at least two active hydrogen atoms selected from the group consisting of polyether polyols, polyester polyols, and mixtures thereof.

3,939,125
DIGLYCIDYLIMIDAZOLIDONES

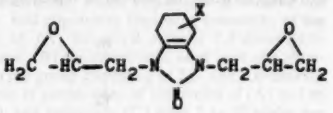
Daniel Porret, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 319,961, Dec. 29, 1971, Pat. No. 3,828,066. This application Apr. 12, 1974, Ser. No. 460,408
Int. Cl.² C08G *59/26*
U.S. Cl. 260—77.5 C **2 Claims**

1. A curable mixture which serves for the manufacture of moldings, comprising a diglycidyl compound of the formula

(I) 

or

(II) 

wherein X is hydrogen or alkyl of 1 to 4 carbon atoms, and a curing agent for epoxy resins.

3,939,126
ACRYLYL-TERMINATED UREA-URETHANE COMPOSITIONS

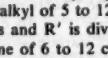
Charles H. Carder, Charleston, W. Va., and George W. Borden, East Lyme, Conn., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 5, 1974, Ser. No. 503,473
Int. Cl.² C08G *18/32*
U.S. Cl. 260—77.5 CR **8 Claims**

1. An acrylyl-terminated urea-urethane comprising the reaction product obtained by reacting a mixture consisting essentially of:

a. an organic polyisocyanate having at least 2 isocyanato groups;

b. a hydroxylamine of the structure:



wherein R is hydrogen, alkyl of from 1 to 10 carbon atoms cycloalkyl of 5 to 12 carbon atoms or aryl of 6 to 12 carbon atoms and R′ is divalent alkylene of 1 to 12 carbon atoms, arylene of 6 to 12 carbon atoms or cycloalkylene of 5 to 12 carbon atoms; and

c. a hydroxyhydrocarbyl acrylate of the structure:

wherein Z is hydrogen or methyl and R′ is as hereinbefore defined; and wherein the number of equivalents of isocyanato groups in the organic polyisocyanate charged is from about 80 percent to about 105 percent of the sum total of the number of equivalents of hydrogen atoms reactive therewith that are present in the hydroxyl and amine groups in said hydroxylamine and in said hydroxyhydrocarbyl acrylate.

3,939,127
POWDER PAINT WITH EPOXY AND AMIDE COPOLYMER AND MIXTURE OF DICARBOXYLIC ACIDS AND POLYANHYDRIDES

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 394,881, Sept. 6, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,456
Int. Cl.² C08G *59/42*, *81/02*; C08F *220/32*
U.S. Cl. 260—78.4 D **5 Claims**

1. In a thermosettable powder paint which exclusive of pigments, catalysts, antistatic agents, plasticizers, and flow control agents, the same being conventional non-reactive additives to the thermosettable powder paint, consists essentially of a coreactive particulate mixture of

1. a qualitatively difunctional copolymer of about 5 to about 20 weight percent of a glycidyl ester of a monoethylenically unsaturated acid and about 95 to about 80 weight percent of monoethylenically unsaturated monomers and having a glass transition temperature in the range of about 40°C. to about 90°C. and a molecular weight (M_n) in the range of about 1500 to about 15,000, and
2. a C_4 – C_{20} saturated, straight chain, aliphatic dicarboxylic acid,

the improvement wherein

A. said copolymer is qualitatively difunctional and said other monoethylenically unsaturated monomers consist essentially of an alpha-beta olefinically unsaturated amide in an amount comprising about 2 to about 10 weight percent of said copolymer and monofunctional monomers selected from the group consisting of esters of a C_1 – C_8 monohydric alcohol and acrylic acid esters of a C_1 – C_8 monohydric alcohol and methacrylic acid and C_8 – C_{12} monovinyl hydrocarbons, and

B. there is substituted for a portion of said dicarboxylic acid a polyanhydride having molecular weight in the range of about 1000 to about 5000 and the resultant mixture of said dicarboxylic acid and said polyanhydride is proportional and quantified such that said dicarboxylic acid is present in an amount that provides about 0.1 to about 0.6 carboxyl groups per epoxy group on said copolymer and said polyanhydride is present in an amount that provides about 0.2 to about 1.1 anhydride groups per epoxy group on said polymer.

3,939,128
VULCANIZATION OF HALOGEN OR EPOXY-CONTAINING POLYACRYLATE ELASTOMERS

Rudolf Adolf Behrens, Gladstone, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 158,601, June 30, 1971, abandoned. This application July 11, 1973, Ser. No. 378,084. The portion of the term of this patent subsequent to July 17, 1990, has been disclaimed.
Int. Cl.² C08F *28/02*
U.S. Cl. 260—79.5 P **14 Claims**

1. A vulcanizable halogen or epoxy-containing polyacrylate elastomer composition comprising, for each 100 parts by weight of said elastomer, from about 0.05 to 2.5 parts of sulfur

and from about 0.5 to 7 parts by weight of either the sodium or potassium salt of 2-ethylhexanoic acid.

3,939,129

PROCESS FOR THE PREPARATION OF RANDOM COPOLYMERS OF MONO-OLEFINS OR OF MONO-OLEFINS AND UNCONJUGATED DIENES WITH LACTAMS WITH SUBSTITUTION ON THE NITROGEN ATOM BY AN UNSATURATED RADICAL

Gilbert Marie, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

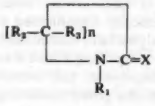
Filed Apr. 11, 1974, Ser. No. 460,078

Claims priority, application France, Apr. 12, 1973, 73.13309

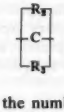
Int. Cl.[2] C08F 210/00, 4/06, 4/42

U.S. Cl. 260—79.7 26 Claims

1. A process for the preparation of substantially linear amorphous, random copolymers of mono-olefins, or mono-olefins and unconjugated dienes, with unsaturated lactams of the general formula

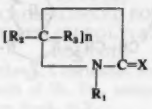


where R_1 is a monovalent alkenyl radical containing 2 to 8 carbon atoms, R_2 and R_3, which are identical or different, represent hydrogen or a monovalent hydrocarbon radical, free of ethylenic unsaturation and containing 1 to 8 carbon atoms, X represents oxygen or sulphur, and n is an integer of from 3 to 14 representing the number of repeating units



in the lactam ring so that the number of carbon atoms in the ring is equal to ($n = 1$) comprising contacting at least 2 mono-olefins containing from 2 to 20 carbon atoms in their molecules or at least 2 such mono-olefins and an unconjugated diene, in an inert liquid medium at a temperature of between −80°C and +150°C, with at least one of said unsaturated lactams, in the form of a complex formed with a Lewis acid, in at least stoichiometric amounts, in the presence of a catalytically effective amount of a catalyst system formed by the combination of an organometallic compound of at least one metal in columns I, II, or III of the periodic table of elements with a compound of a transition metal in columns IV to VIII of the periodic table, at a ratio of the number of atoms of the first metal to the number of atoms of the second metal of between 1 and 50, to obtain said copolymer.

15. A substantially linear, amorphous, random copolymer consisting of 99.9 to 80% weight of non-polar groups having at least 2 mono-olefins containing 2 to 20 carbon atoms in their molecules or at least 2 such mono-olefins and an unconjugated diene, and 0.1 to 20% polar groups having at least 1 unsaturated lactam of the general formula



where R_1 is a monovalent alkenyl radical containing 2 to 8 carbon atoms, R_2 and R_3, which are identical or different, represent hydrogen or a monovalent hydrocarbon radical free of ethylenic unsaturation and containing 1 to 8 carbon atoms, X represents oxygen or sulphur, and n is an integer of from 3 to 14 representing the number of repeating units

in the lactam ring so that the number of carbon atoms in the ring is equal to ($n + 1$).

26. Elastomers as defined in claim 25, in which the substrate is a metal surface.

3,939,130

POLYMERS OF MONOMERS CONTAINING ACTIVE METHYLENE GROUPS AND OTHER ETHYLENICALLY UNSATURATED MONOMERS

Ignazio S. Ponticello, Rochester, N.Y., assignor to Indicon Inc., Danbury, Conn.

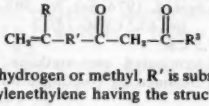
Filed Aug. 15, 1974, Ser. No. 497,803

Int. Cl.[2] C08F 28/00; C08G 75/00

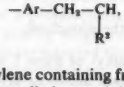
U.S. Cl. 260—65 11 Claims

1. A polymer prepared from components comprising:

A. from about 1 to about 100 percent by weight of a polymerizable monomer containing at least one active methylene group and having the formula



wherein R is hydrogen or methyl, R′ is substituted or unsubstituted arylenethylene having the structure



wherein Ar is arylene containing from 6 to 12 carbon atoms, R^2 is hydrogen, alkyl containing from 1 to 10 carbon atoms, aryl containing from 6 to 12 carbon atoms, or cycloalkyl containing from 5 to 7 carbon atoms, and R^3 is alkoxy containing from 1 to 10 carbon atoms, amino having the structure

wherein R^4 and R^5 are independently selected from the group consisting of hydrogen, alkyl containing from 1 to 10 carbon atoms, cycloalkyl containing from 5 to 7 carbon atoms, and aryl containing from 6 to 12 carbon atoms; cycloalkyl containing from 5 to 7 carbon atoms, or aryl containing from 6 to 12 carbon atoms; and

B. from 0 to about 99% by weight of at least one additional polymerizable ethylenically unsaturated monomer.

3,939,131

2,4-DIMETHYL-4-VINYL-1-CYCLOHEXENE-2,6- OR 3,6-IMETHYL-1,3,6-OCTATRIENE COPOLYMER RESIN

Hiroyuki Morikawa; Tosio Sugimoto, and Kazuo Sato, all of Ami, Japan, assignors to Mitsui Petrochemical Industries, Inc., Tokyo, Japan

Filed Aug. 19, 1974, Ser. No. 498,403
Claims priority, application Japan, Aug. 22, 1973, 48-93361
Int. Cl.² C08F 236/22
U.S. Cl. 260—80.7 21 Claims

1. A copolymer of 2,4-dimethyl-4-vinyl-1-cyclohexene and at least one member of the group consisting of 2,6- and 3,6-dimethyl-1,3,6-octatrienes, which copolymer is suitable for use as a tackifier, said copolymer consisting essentially of the reaction product of: (A) structural units of 2,4-dimethyl-4-vinyl-1-cyclohexene; (B) structural units of at least one member selected from the group consisting of 2,6- and 3,6-dimethyl-1,3,6-octatrienes in proportions of 100 moles of (A) to 1 to 400 moles of (B); and optionally (C) from 1 to 50 moles per 100 moles of component (A), at least one unsaturated compound selected from the group consisting of isoprene, butadiene piperylene, cyclopentadiene, styrene, vinyltoluene, alpha-methylstyrene, isobutylene, vinylcyclohexene and alpha-pinene, and characterized by containing not more than seven unsaturated double bonds per 100 carbon atoms per copolymer molecule, and having a softening point of 85°–160°C. and a number average molecular weight of 450–1850.

3,939,132

PROCESS FOR THE PREPARATION OF RANDOM COPOLYMERS OF MONO-OLEFINS OR OF MONO-OLEFINS AND UNCONJUGATED DIENES WITH UNSATURATED DERIVATIVES SELECTED FROM N-VINYLIMIDAZOLES AND N-VINYLIMIDAZOLINES

Gilbert Marie, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Filed Apr. 11, 1974, Ser. No. 460,079
Claims priority, application France, Apr. 12, 1973, 73.13307
Int. Cl.² C08F 210/00, 4/06, 4/42
U.S. Cl. 260—80.72 28 Claims

1. A process for the preparation of substantially linear, amorphous, random copolymers of mono-olefins, or mono-olefins and unconjugated dienes, with a member selected from the group consisting of N-vinylimidazole, N-vinylimidazoline, ring substituted N-vinyl-imidazoles and ring substituted N-vinylimidazolines wherein the substituents are hydrocarbon radicals and amino-hydrocarbon radicals, comprising contacting at least two mono-olefins containing from 2 to 20 carbon atoms in their molecule or at least two such mono-olefins and said unconjugated diene in a liquid medium at a temperature of between −80° to 150°C with at least one of the said members in the form of a complex with a Lewis acid, in the presence of the catalyst system formed by the combination of an organometallic compound of at least one metal in column I, II or III of the periodic table of elements with a compound of a transition metal in columns IV to VIII of said periodic table at a ratio of the number of atoms of the first metal to the number of atoms of the second metal of between 1 and 50, to obtain the desired copolymer.

16. A substantially linear, amorphous random copolymer, characterized by the fact that it contains 99.9 to 80% weight of non-polar groups from at least 2 mono-olefins containing 2 to 20 carbon atoms in their molecule or at least 2 such mono-olefins and an unconjugated diene, and 0.1 to 20 percent polar groups from at least 1 member selected from the group consisting of N-vinylimidazole, N-vinylimidazoline, ring substituted N-vinylimidazoles and ring substituted N-vinylimidazolines wherein the substituents are hydrocarbon radicals and amino-hydrocarbon radicals.

28. Elastomers as defined in claim 27, vulcanized on a metal surface.

3,939,133

SYNERGISTIC PEROXIDE CURES FOR HIGH VINYL RUBBERS

Mark R. Roodvoets, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 10, 1974, Ser. No. 468,701
Int. Cl. C08d 5/02, 3/08
U.S. Cl. 260—85.1 24 Claims

1. A peroxide cured high vinyl resin composition comprising by weight, 100 parts of a peroxide cured resin selected from the class consisting of a homopolymer of butadiene or a copolymer of butadiene and styrene containing at least 40 percent of butadiene, at least 80 percent of the butadiene repeating units in the polymer or copolymer being in the 1,2-configuration, said resin cured utilizing from 0.4 to about 4.0 parts based upon an equivalent amount of dicumyl peroxide of a peroxide curing agent selected from a first class consisting of dicumyl peroxide, bis (t-butylperoxy) diisopropyl benzene, t-butyl perbenzoate, and n-butyl 4,4-bis (t-butylperoxy) valerate and from 0.25 to about 2.5 parts based upon an equivalent amount of dicumyl peroxide of a peroxide curing agent selected from a second class consisting of benzoyl peroxide, bis (4-t-butylcyclohexyl) peroxydicarbonate, t-butyl peroctoate, 2,5-dimethyl-2,5-bis(t-butylperoxy)-hexane, 2,5-dimethyl-2,5-bis (t-butylperoxy)-hexyne-3, and t-butyl hydroperoxide.

3,939,134

CATALYTIC PROCESS FOR PREPARING POLYMERS AND COPOLYMERS OF ACRYLONITRILE

Luciano Console, Mirano (Venice); Alessandro Zecchin, Sassari, and Antonio Quarta, Porto Torres (Sassari), all of Italy, assignors to Societa' Ittiliana Resine S.I.R. S.p.A., Milan, Italy

Filed July 8, 1974, Ser. No. 486,736
Claims priority, application Italy, July 6, 1973, 26266/73
Int. Cl.² C08F 3/76, 15/22
U.S. Cl. 260—85.5 R 12 Claims

1. The method of polymerizing a monomer composition containing at least 85% by weight of acrylonitrile and up to 15% by weight of a further ethylenically unsaturated monomer copolymerizable therewith, which method comprises contacting the monomer composition in a aqueous medium at a temperature from 40° to 70°C with a catalytic composition comprising hydrogen peroxide, a water-soluble salt of a hydroxylamine mono- or di-sulfonic acid and a water-soluble ferrous salt, wherein the proportion of said catalytic system is from 0.05 to 5 parts by weight to 100 parts by weight of said monomer composition, wherein the molar ratio of said hydrogen peroxide to said sulfonic acid salt is from 0.05:1 to 20:1, and wherein the molar ratio of said hydrogen peroxide to said ferrous salt is from $1:10^{-3}$ to $1:10^{-6}$.

3,939,135

COFUSED RESINS AND THEIR PREPARATION

Jesse C. H. Hwa, Stamford, Conn.; Paul Kraft, Yonkers, and Leonard Feiler, Riverdale, both of N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

Continuation of Ser. No. 682,384, Nov. 13, 1968, abandoned, which is a continuation-in-part of Ser. No. 585,052, Oct. 7, 1966, abandoned. This application Feb. 8, 1971, Ser. No. 113,689
Int. Cl.² C08F 6/14, 6/24
U.S. Cl. 260—87.1 10 Claims

1. A reticulated resin structure in the form of a dry, free flowing powder, said resin structure comprising a plurality of vinyl polymer resin particles which are fused to one another at a plurality of contact points in a manner such that said resin structure has interstices between the thus fused particles thereof; said reticulated resin structure being prepared by means of a process which comprises intimately mixing an aqueous emulsion or suspension of discrete particles of a vinyl polymer and an at least partially water-miscible organic sol-

vent system selected from the group consisting of ketones having from 3 to 6 carbon atoms, mixtures of such ketones with water-miscible lower alkanols of 1 to 5 carbons which are miscible with both the ketone and the water, dioxane, tetrahydrofuran, diemthylacetamide and mixtures of these, and heating the admixture to a temperature of at least 40°C. and for a time sufficient to soften said vinyl polymer particles without fully solubilizing said particles and fuse said particles together with one another into a resin having a reticulated structure with interstices between said fused particles and sufficient to provide fused particles having a surface area of at least $2M^2/g$ as measured by the BET method, a dry aggregate strength as measured by the Instron method of at least α - 20, a wet aggregate strength as measured by the modified Brookfield test of from about $\beta = 8$ to about $\beta = 130$ and a maximum bulk density by the ASTM-D1182 method of about 30 grams per 100 milliliters, and then separating the resulting reticulated resin structure.

3,939,136
POLYMERISATION OF CYCLOOCTENE

Manfred Zimmermann, Cologne; Guenther Lehnert, Leverkusen; Dieter Maertens, Leverkusen, and Gottfried Pampus, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed July 2, 1974, Ser. No. 485,294

Claims priority, application Germany, July 7, 1973, 2334604

Int. Cl.² C08F *4/14*

U.S. Cl. 260—93.1 **6 Claims**

1. A process for the production of a polyoctenamer in which at least 80% of the C=C -double bonds are in the cis-configuration, wherein cyclooctene is polymerised in an inert organic solvent at a temperature of from −50° to +10°C. in the presence of a catalyst comprising:

A. a tungsten halide or oxyhalide;

B. an alcohol or a halogen substituted alcohol;

C. an organometallic compound of aluminum and

D. boron trifluoride or boron trifluoride therate,

components A and B being in a molar ratio of from 1:1 to 1:5, components C and A being in a molar ratio of from 1:1 to 1:6 and components D and A being in a molar ratio of from 0.1:1 to 10:1.

3,939,137
SILANE ADJUVANT FOR CHROMIUM OXIDE CATALYST

John P. Hogan; Benny E. Nasser, and Joseph A. Delap, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 22, 1974, Ser. No. 526,158

Int. Cl.² C08F *4/24*, *110/02*

U.S. Cl. 260—94.9 C **10 Claims**

1. A polymerization process which comprises contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule in the presence of a liquid solvent with a catalyst system comprising (1) a calcined support containing chromium in the form of chromium oxide at least a part of said chromium being in the hexavalent state and (2) a silane of the formula $R_{4-n}SiH_n$ wherein n is an integer from 0 to 3 and R is a saturated or unsaturated hydrocarbon group containing from 1 to 10 carbon atoms per molecule selected from alkyl, alkenyl, aryl, aralkyl, alkaryl, and cycloalkyl groups.

3,939,138
RADICAL POLYMERIZATION INITIATOR ANDD PROCESS FOR ITS PREPARATION

Souichi Suzuki; Hiroshi Horino, both of Yokohama, and Tetsu Ohishi, Tokyo, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Sept. 4, 1974, Ser. No. 503,189

Claims priority, application Japan, Sept. 6, 1973, 48-99675

Int. Cl.² C09F *1/40*

U.S. Cl. 260—100 **9 Claims**

1. A radical emulsion-, suspension-, or aqueous-polymerization initiator consisting essentially of as an active ingredient a hydroperoxide of disproportionated rosin acid, alkali metal salt thereof, ammonium salt thereof, hydrogenated rosin acid, alkali metal salt thereof, or ammonium salt thereof, said active ingredient being prepared by contacting disproportionated rosin acid, alkali metal salt thereof, ammonium salt thereof, hydrogenated rosin acid, alkali metal salt thereof, or ammonium salt thereof with molecular oxygen in water or an organic solvent in the presence of a radical reaction initiator at a temperature of 0° to 150°C. and a pressure of 0 to 100 $kg/cm^2.G$ to form the hydroperoxide thereof.

3,939,139
NEW ANTIBIOTIC X-1092

David Pruess, and James Parnell Scannell, both of North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sept. 9, 1974, Ser. No. 504,598

Int. Cl.² C07C *103/52*; C12B *1/00*

U.S. Cl. 260—112.5 R **1 Claim**

1. A compound of the formula:

1-(s)-hydroxy-2-(S,S)-valylamido-cyclobutane-1-acetic acid and its pharmaceutically acceptable salts.

3,939,140
PROCESS FOR THE PREPARATION OF A DYESTUFF CONSISTING SUBSTANTIALLY OF ONLY UNSYMMETRICAL 1:2-CHROMIUM COMPLEX AZO DYESTUFFS

Fritz Meininger, Frankfurt am Main, and Hermann Fuchs, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

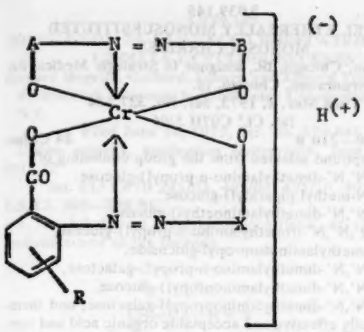
Continuation of Ser. No. 245,767, April 20, 1972, abandoned. This application June 17, 1974, Ser. No. 480,206

Claims priority, application Germany, Apr. 23, 1971, 2119830

Int. Cl.² C09B *45/06*, *45/16*

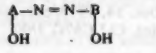
U.S. Cl. 260—145 A **15 Claims**

1. A process for the preparation of a dyestuff consisting essentially of an unsymmetrical 1:2-chromium complex azo dyestuff of the formula



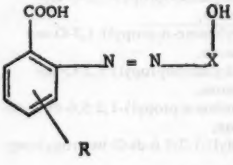
(1)

wherein A is phenylene unsubstituted by sulfonic acid or phenylene unsubstituted by sulfonic acid and substituted by chlorine, bromine, nitro, methyl, ethyl, methoxy, ethoxy, sulfamoyl or carbamoyl, B and X each is naphthalene, pyrazolone or acetoacetyl-phenylamide each of which is unsubstituted by sulfonic acid, and R is hydrogen, chlorine, bromine, methyl, β-hydroxyethylsulfonyl, carboxyl, sulfamoyl, sulfo-N-monoalkylamino or sulfo-N-dialkylamino in which said alkyl is of one to four carbon atoms, which process comprises heating a mixture of an o,o'-dihydroxy azo compound of the formula



(2)

and an o-carboxy-o'-hydroxy azo compound of the formula



(3)

said compounds of the formulas (2) and (3) being unsubstituted by sulfonic acid, in a molar ratio of said compound of the formula (2) to said compound of the formula (3) in the range of about 1:0.75 to about 1:1 with about 1.0 to 1.1 molar amount of chromium-III compound, calculated on the compound of formula (2), in an organic solvent to a temperature of about 105°C. to about 120°C. to completely metallize said compound of the formula (2), and then heating said mixture at a pH of about 5.0 to about 6.5 at a temperature of about 70°C. to about 90°C. to form said unsymmetrical dyestuff of the formula (1).

3,939,141

WATER-SOLUBLE COPPER COMPLEX PHENYL AZO NAPHTHALENE REACTIVE DYESTUFFS

Fritz Meininger, Frankfurt am Main, and Reinhard Hahnle, Hofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

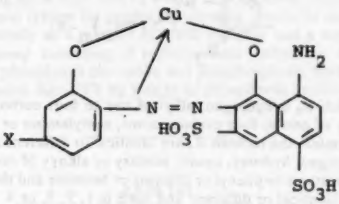
Continuation-in-part of Ser. No. 205,397, Dec. 6, 1971, abandoned. This application Jan. 3, 1974, Ser. No. 430,485

Claims priority, application Germany, Dec. 7, 1970, 2060081

Int. Cl.[2] C09B *45/18, 62/44, 62/74, 62/82*

U.S. Cl. 260—151 **4 Claims**

1. A water soluble copper-complex monoazo dyestuff of the formula



wherein X is

—CH=CH$_2$ or

—SO$_2$ — CH$_2$ — CH$_2$ —Z

in which Z is hydroxy, sulfato, thiosulfato, phosphato, dimethylamino or diethylamino.

3,939,142

PHENYLAZOPHENYL DYESTUFF

Erwin Fleckenstein, Hofheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

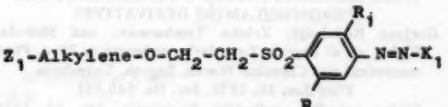
Filed Aug. 6, 1974, Ser. No. 495,191

Claims priority, application Germany, Aug. 6, 1973, 2339713

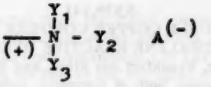
Int. Cl.[2] C07C *115/00*

U.S. Cl. 260—205 **3 Claims**

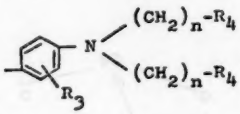
1. A basic azo dyestuff, free from sulfo groups and having the formula



wherein Z_1 is the quaternary salt of the formula



wherein Y_1 and Y_3 are identical or different and each is alkyl of one to six carbon atoms, or benzyl or cyclohexyl, Y_3 is hydrogen, alkyl of one to four carbon atoms, benzyl or alkoxy and/or Y_1, Y_2 and/or Y_3 together with the N-atom form the morpholine, piperidine or pyridine ring and $A^{(-)}$ is an anion, alkylene is alkylene of two or three carbon atoms, R_1 is hydrogen, chlorine, bromine, methoxy, ethoxy, methyl or ethyl, R_2 is hydrogen, methoxy, ethoxy, methyl or ethyl and K_1 is a radical of the formula



in which R_3 is hydrogen, alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms, acetylamino or chlorine or bromine, the radicals R_4 are identical or different and each is hydrogen, hydroxy, cyano, acetoxy or alkoxy of one to four carbon atoms or phenyl or chlorine or bromine and the indices *n* are identical or different and each is 1, 2, 3, or 4.

3,939,143
1-N-ISOSERYLKANAMYCINS AND THE PRODUCTION THEREOF

Hamao Umezawa; Kenji Maeda, both of Tokyo; Shinichi Kondo, Yokohama, and Sumio Umezawa, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed May 1, 1974, Ser. No. 466,053

Claims priority, application Japan, May 15, 1973, 48-53151; Aug. 29, 1973, 48-96176

Int. Cl.² C07A *15/04*

U.S. Cl. 260—210 K **11 Claims**

1. A compound selected from the group consisting of 1-N-isoserylkanamycin; 1-N-isoserylkanamycin B; 1-N-isoseryl-3′,4′-dideoxykanamycin B; and the pharmaceutically acceptable acid-addition salts thereof.

3,939,144
MANUFACTURE OF N-(BENZENESULFONYL)-5-O-DESOSAMINYL-ERYTHROMYCILAMINE DERIVATIVES

Gorjana Radobolja; Zrinka Tamburasev, and Slobodan Djokic, all of Zagreb, Yugoslavia, assignors to Pliva, Pharmaceutical and Chemical Works, Zagreb, Yugoslavia

Filed Jan. 10, 1975, Ser. No. 540,151

Claims priority, application Yugoslavia, Jan. 14, 1974, 97/74

Int. Cl.² C07H *15/22*

U.S. Cl. 260—210 E **5 Claims**

1. An N-(4-R^2-benzenesulfonyl)-5-0-desosaminyl-erythromycilamine, wherein R^2 is a C_1-C_5 alkyl radical, halogen or NH_2.

3,939,145
NOVEL ETHEREALLY MONOSUBSTITUTED MONOSACCHARIDES

Paul Gordon, Chicago, Ill., assignor to Strategic Medical Research Corporation, Chicago, Ill.

Filed Mar. 1, 1973, Ser. No. 337,134

Int. Cl.² C07H *5/06*

U.S. Cl. 260—210 R **24 Claims**

1. A compound selected from the group consisting of 3-O-3′-(N′,N′-dimethylamino-n-propyl)-glucose, 3-O-4′-(N-methyl piperidyl)-glucose, 3-O-2′-(N′,N′-dimethylaminoethyl)-glucose, 3-O-3′-(2′,N′,N′-trimethylamino-n-propyl)-glucose, α-N,N-dimethylaminoisopropyl-glucoside, 6-O-3′-(N′,N′-dimethylamino-n-propyl)-galactose, 3-O-2′-(N′,N′-dimethylaminopropyl)-glucose, 6-O-2′-(N′,N′-dimethylaminopropyl)-galactose, and therapeutically effective and acceptable organic acid and inorganic acid salts thereof.

3,939,146
NOVEL ETHEREAL MONOSUBSTITUTIONS OF MONOSACCHARIDE DERIVATIVES

Paul Gordon, Chicago, Ill., assignor to Strategic Medical Research Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 337,134, March 1, 1973. This application Dec. 14, 1973, Ser. No. 424,786

Int. Cl.² C07G *3/00*

U.S. Cl. 260—210 R **23 Claims**

1. A compound selected from the group consisting of 3-O-3′-(N′,N′-dimethylamino-n-propyl)-1,2-O-isopropylideneglucofuranose, 3-O-4′-(N′-methylpiperidyl)-1,2-O-isopropylideneglucosefuranose, 3-O-2′-(N′,N′-dimethylaminoethyl)-1,2-O-isopropylideneglucofuranose, 3-O-3′-(2′,N′,N′-trimethylamino-n-propyl)-1,2-O-isopropylideneglucofuranose, 3-O-2′-(N′,N′-dimethylaminopropy)-1,2-O-isopropylideneglucosefuranose, 6-O-3′-(N′,N′-dimethylamino-n-propyl)-1,2-O-isopropylidenegalactopyranose, 6-O-2′-(N′,N′-dimethylaminopropyl)-1,2-O-isopropylidenegalactopyranose, 3-O-3′-(N′,N′-dimethylamino-n-propyl)-1,2:5,6-di-O-isopropylideneglucofuranose, 3-O-4′-(N′-methylpiperidyl)-1,2:5,6-di-O-isopropyleneglucofuranose, 3-O-2′-(N′,N′-dimethylaminoethyl)-1,2:5,6-di-O-isopropyleneglucofuranose, 3-O-3′-(2′,N′,N′-trimethylamino-n-propyl)-1,2:5,6-di-O-isopropyleneglucofuranose, 3-O-2′-(N′,N′-dimethylaminopropyl)-1,2:5,6-di-O-isopropyleneglucofuranose, 6-O-3′-(N′,N′-dimethylamino-n-propyl)-1,2:3,4-di-O-isopropylidenegalactopyranose, 6-O-2′-(N′,N′-dimethylaminopropyl)-1,2:3,4-di-O-isopropylidenegalactopyranose, α-N′,N′-dimethylamino-iso-propyl-2,3:5,6-di-O-isopropylideneglucofuranoside,

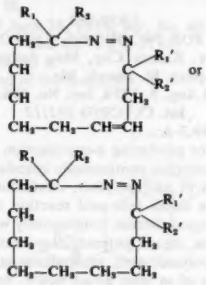
and therapeutically effective and acceptable organic and inorganic acid salts thereof.

3,939,147
NOVEL 1,2-DIAZA-1,5,9-CYCLO DODECATRIENES AND 1,2-DIAZA-1-CYCLODODECENES

Bernard Hugelin, Gaillard, France, and Eduard Troxler, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 14, 1973, Ser. No. 370,081
Claims priority, application Switzerland, June 16, 1972, 9112/72
Int. Cl.² C07D *245/02, 405/04, 405/10, 405/14*
U.S. Cl. 260—239 BC **15 Claims**

1. A 1,2-diaza-1,5,9-cyclododecatriene or 1,2-diaza-1-cyclododecene of the formula



or

wherein

R_1 and R_1' independently of one another denote alkyl of one to six carbon atoms; alkenyl of up to four carbon atoms; alkyl of one to four carbon atoms substituted by phenyl; alkenyl of up to four carbon atoms substituted by phenyl; cyclohexyl; phenyl; phenyl substituted in the 4-position by a halogen atom, an alkyl of one to four carbon atoms or an alkoxy of one to four carbon atoms; 1-naphthyl; or 3,4-methylenedioxyphenyl;

R_2 and R_2' independently of one another denote hydrogen; alkyl of one to four carbon atoms; or

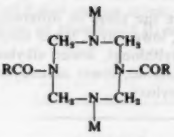
R_1 and R_2, or R_1' and R_2', together with the carbon atoms to which they are bonded form a cycloalkyl ring of five to 12 carbon atoms.

3,939,148
PROCESS FOR PREPARING 1,3,5,7-TETRANITRO-1,3,5,7-TETRAAZACYCLOOCTANE

Victor I. Siele, Succasunna, and Everett E. Gilbert, Morristown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 25, 1974, Ser. No. 445,738
Int. Cl.² C07D *257/02*
U.S. Cl. 260—239 HM **18 Claims**

1. A process for preparing 1,3,5,7-tetranitro-1,3,5,7-tetraazacyclooctane, which comprises the step of reacting an N-acylated-1,3,5,7-tetraazacyclooctane of the following formula



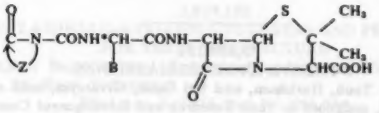
wherein R is an alkyl radical of 1 to 6 carbon atoms, and M in both cases is the same and is either a nitro group or an acyl radical of the formula RCO—, wherein R has the aforesaid definition, with nitrogen pentoxide in the presence of a liquid diluent from the group consisting of a nitroparaffin, methylene chloride, chloroform, 100% nitric acid, polyphosphoric acid containing more than 75% by weight of phosphorus pentoxide and a liquid system for producing nitrogen pentoxide consisting essentially of a mixture of 100% nitriacid and a material of the group consisting of trifluoroacetic anhydride, sulfur trioxide, phosphorus pentoxide and polyphosphoric acid containing more than 75% by weight of phosphorus pentoxide.

3,939,149
UREIDOACETAMIDO-PENICILLINS

Hans-Bodo König; Wilfried Schrock, both of Wuppertal-Elberfeld; Hans Disselnkotter, Cologne, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

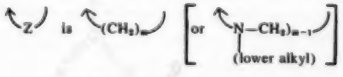
Division of Ser. Nos. 145,809, May 21, 1971, abandoned, and Ser. No. 145,877, May 21, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 426,188
Claims priority, application Germany, May 25, 1970, 2025414; May 25, 1970, 2025415
Int. Cl.² C07D *499/46*
U.S. Cl. 260—239.1 **5 Claims**

1. A compound selected from the group consisting of a penicillin of the formula:



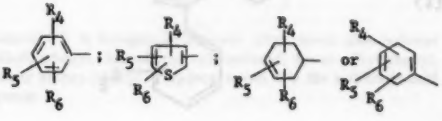
and the pharmaceutically acceptable nontoxic salts thereof wherein

the carbon atom designated by * constitutes a center of chirality,



in which m is 3, and

B is



wherein

R_4, R_5 and R_6 are the same or different, and are each hydrogen, halo, lower alkyl, lower alkoxy, lower alkylthio, lower alkylthionyl, lower alkylsulphonyl, nitro, di(lower alkyl)amino, lower alkanoylamino, hydroxy, or lower alkanoyloxy.

3,939,150

PENICILLIN DERIVATIVES

Masuo Murakami, Tokyo; Ichiro Isaka, Hoya; Khozi Nakano, Shiraoka; Isao Souzu, Urawa; Akio Koda, Hoya; Teruaki Ozasa, Urawa; Teruya Kashiwagi, Ageo, and Yukiyasu Murakami, Urawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1974, Ser. No. 514,363

Claims priority, application Japan, Oct. 19, 1973, 48-118390; Nov. 16, 1973, 48-129067; Apr. 4, 1974, 49-38146; July 27, 1974, 49-86355; Sept. 6, 1974, 49-102685

Int. Cl.² C07D *499/68*

U.S. Cl. 260—239.1 1 Claim

1. α-(4-Oxo-4H-thiopyran-3-carboxamido)-p-hydroxybenzylpenicillin and its pharmaceutically acceptable acid addition salts.

3,939,151

DISPLACEMENT OF THE THIAZOLIDINE RING IN PENICILLIN WITH THE FORMATION OF A BIOLOGICALLY ACTIVE CEPHEM SYSTEM

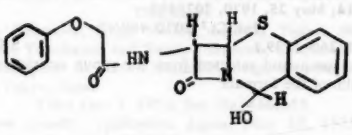
John C. Sheehan, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed July 25, 1974, Ser. No. 491,873

Int. Cl.² C07D *501/24*

U.S. Cl. 260—243 C 1 Claim

1. A biologically active material of the formula



3,939,152

5-PHENYL-2,4-BENZODIAZEPINES

William Taub, Harishom, and Uri Golik, Givataym, both of Israel, assignors to Yeda Research and Development Company Ltd., Israel

Filed Mar. 29, 1974, Ser. No. 456,015

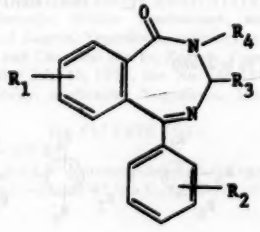
Claims priority, application United Kingdom, Apr. 4, 1973, 16109/73

Int. Cl.² C07D *243/00*

U.S. Cl. 260—239.3 B 10 Claims

1. A compound of the formula (I):

(I)



or a pharmaceutically acceptable salt or N-oxide thereof wherein R_1 is a hydrogen or halogen atom or a nitro, methyl, cyano or trifluoromethyl group; R_2 is a hydrogen or halogen atom or a nitro, methyl, cyano or trifluoromethyl group; R_3 is a hydrogen atom or a methyl group; R_4 is a hydrogen atom or a methyl or ethyl group.

3,939,153

PROCESS FOR PRODUCING CAPROLACTAM

Frank C. Fowler, Kansas City, Mo., assignor to Hillyard Chemical Company, St. Joseph, Mo.

Filed Aug. 9, 1974, Ser. No. 496,258

Int. Cl.² C07D *201/12*

U.S. Cl. 260—239.3 A 8 Claims

1. A process for producing e-caprolactam from a polymer thereof which comprises continuously introducing into a reaction zone a melt of said polymer, continuously introducing high temperature steam into said reaction zone as the sole depolymerizing agent therein, continuously withdrawing from said reaction zone, steam, polymer degradation products and undecomposed polymer melt, maintaining said reaction zone at a temperature of at least about 600°F. and recovering e-caprolactam from said polymer degradation products as a product of said process.

3,939,154

PYRAZOLINE DERIVATIVES

Ivan Joseph Bolton, Bingley, England; Fritz Fleck, Bottmingen, Switzerland, and Alec Victor Mercer, Leeds, England, assignors to Sandoz Ltd., (Sandoz AG), Basle, Switzerland

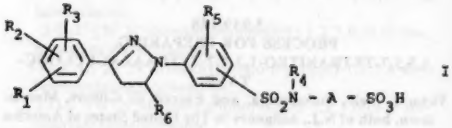
Filed Jan. 24, 1974, Ser. No. 436,129

Claims priority, application United Kingdom, Jan. 29, 1973, 4366/73

Int. Cl.² C07D *231/06*

U.S. Cl. 260—239.9 62 Claims

1. A compound of formula I,



I

in which R_1 is halogen or alkyl of 1 to 4 carbon atoms, R_2 and R_3, which may be the same or different, are hydrogen, halogen or alkyl of 1 to 4 carbon atoms,

R_4 is hydrogen or alkyl of 1 to 4 carbon atoms,
R_5 signifies a hydrogen atom, a halogen atom, an alkyl radical of 1 to 4 carbon atoms or an alkoxy radical of 1 to 4 carbon atoms,
R_6 is hydrogen or alkyl of 1 to 4 carbon atoms, and
A is an alkylene chain of 1 to 3 carbon atoms,
which compound is in free acid or salt form.

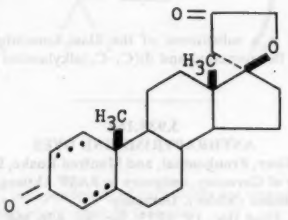
3,939,155

4',5'-DIHYDROSPIRO[ANDROST/ESTR-4-ENE-17,2'(3'H)-FURAN]3,4'-DIONE AND CONGENERS, AND INTERMEDIATES THERETO

Edward A. Brown, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed June 28, 1974, Ser. No. 483,986
Int. Cl.² C07J *21/00*
U.S. Cl. 260—239.55 R **10 Claims**

1. A compound of the formula



wherein the dotted lines in ring A indicate that the compound is Δ^1, Δ^4, or $\Delta^{1,4}$.

5. 4',5'-Dihydrospiro[5α-androstane-17,2'(3'H)-furan]-3β,4'-diol.

8. 4',5'-Dihydro-3-methoxyspiro[estra-2,5(10)-diene-17,2'(3'H)-furan]-4'-ol.

10. 3-Methoxyspiro[estra-1,3,5(10)-triene-17,2'(5'H)-furan].

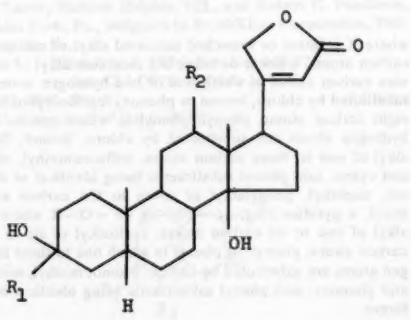
3,939,156

CARDENOLIDES

Hans Peter Albrecht, Lutzelsachsen, and Günter Neugebauer, Mannheim, both of Germany, assignors to Knoll A.G. Chemische Fabriken, Ludwigshafen (Rhine), Germany

Filed July 15, 1974, Ser. No. 488,421
Claims priority, application Germany, July 18, 1973, 2336445
Int. Cl.² C07J *19/00*
U.S. Cl. 260—239.57 **36 Claims**

1. Compound of the formula



in which R_1 is alkyl of 1 to 4 carbon atoms, vicinal epoxy- or dihydroxyalkyl of 2 to 4 carbon atoms, alkenyl or alkinyl of 2 to 4 carbon atoms, or phenyl and R_3 is H or OH.

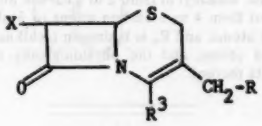
3,939,157

3-BENZYL-7-SUBSTITUTED ACETAMIDO-3-CEPHEM-4-ARBOXYLIC ACIDS AND HALOGENATED BENZYL DERIVATIVES

John Herbert Charles Nayler, Dorking; Michael John Pearson, Roffey, and Robert Southgate, Barns Green, all of England, assignors to Beecham Group Limited, United Kingdom

Continuation of Ser. No. 303,959, Nov. 6, 1972, abandoned. This application July 31, 1974, Ser. No. 493,453
Claims priority, application United Kingdom, Jan. 3, 1972, 142/72; Apr. 21, 1972, 18694/72; Sept. 9, 1972, 41972/72
Int. Cl.² C07D *501/22*
U.S. Cl. 260—243 C **6 Claims**

1. A compound of the formula:



wherein R is phenyl or mono-halophenyl; X is phenylacetamido, phenoxyacetamido, 2-thienylacetamido, α-aminophenylacetamido or α-azidophenylacetamido; and R^3 is a carboxylic acid group, a pharmaceutically acceptable salt of the carboxylic acid group or t-butyl ester of the carboxylic acid group.

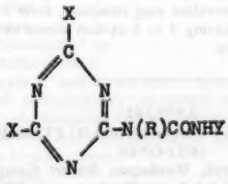
3,939,158

N-(2,4-DIHALO-S-TRIAZIN-6-YL)-UREAS AND PROCESS FOR THEIR MANUFACTURE

Rainer Begrich, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 8, 1974, Ser. No. 495,594
Claims priority, application Switzerland, Aug. 17, 1973, 11870/73
Int. Cl.² C07D *251/50*
U.S. Cl. 260—249.5 **9 Claims**

7. A N-(2,4-dihalo-s-triazin-6-yl)-urea of the formula



(1),

wherein X is halogen, R is lower alkyl, lower alkoxy-lower alkyl, phenyl, halophenyl, nitrophenyl, lower alkyl-phenyl, lower alkoxy-phenyl or hydrogen and Y is the sulphonic acid group.

3,939,159

SPIRO(PYRROLO (1,2-A)QUINOXALINES)

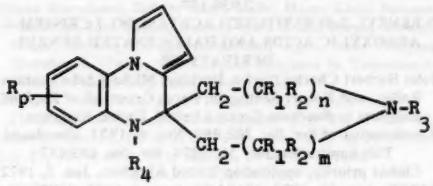
Horst Dornauer, Kelkheim, Germany, and Vernon Brian Anderson, High Bridge, N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed May 29, 1974, Ser. No. 474,447

Int. Cl.² C07D *207/32, 487/20*

U.S. Cl. 260—250 Q **8 Claims**

1. A compound of the formula:



in which R is alkyl or from 1 to 3 carbon atoms, alkoxy of from 1 to 2 carbon atoms or halogen; *m*, *n* and *p* are integers from 0 to 2, the sum of *m* and *n* being from 2 to 4; R_1 and R_2 are hydrogen or methyl; R_3 is hydrogen, alkyl of from 1 to 4 carbon atoms, alkanoyl of from 2 to 6 carbon atoms, cycloalkylcarbonyl of from 4 to 6 carbon atoms or aralkyl of from 7 to 9 carbon atoms; and R_4 is hydrogen or alkanoyl of from 2 to 3 carbon atoms; and the physiologically tolerable acid addition salts thereof.

3,939,160

PTERIDINES

Alexander Stuart, Bromley, England, assignor to Burroughs Wellcome Co., N.C.

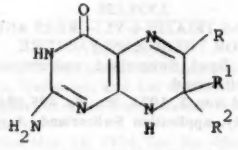
Filed July 26, 1973, Ser. No. 382,715

Claims priority, application United Kingdom, Aug. 1, 1972, 35815/72; Feb. 1, 1973, 5189/73

Int. Cl.² C07D *241/00*

U.S. Cl. 260—251.5 **14 Claims**

1. A compound of formula (I), or a tautomeric form thereof,



(I)

wherein R is a lower alkyl group substituted with one or more halogen atoms, and R^1 and R^2 are the same or different and each is a lower alkyl group or R^1 and R^2, together with the carbon atom in the pteridine ring structure, form a spirocycloalkyl ring system having 4 to 6 carbon atoms outside the pteridine ring structure.

3,939,161

1,3-DIMETHYL- 1H-PYRAZOLO(4,3-D) PYRIMIDINE-7 (6H)-ONES

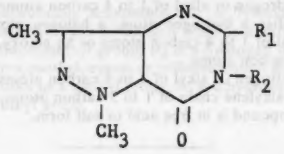
James Daniel Ratajczyk, Waukegan; Robert George Stein, Kenosha, and Leo Ralph Swett, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 29, 1973, Ser. No. 410,588

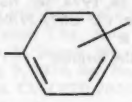
Int. Cl.² C07D *239/00*

U.S. Cl. 260—256.4 F **8 Claims**

1. A compound represented by the structural formula



wherein R_1 is hydrogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, piperidinomethyl, methoxymethyl, N-methylpiperazinomethyl, carbethoxy, or p-chlorophenoxymethyl; and R_2 is hydrogen, C_1–C_4 alkyl, phenyl or



wherein R is a substituent of the class consisting of halo, methyl, tri fluoromethyl and di(C_1–C_4)alkylamino (C_1–C_4)alkyloxy.

3,939,162

ANTHRAPYRIMIDINE DYES

Wolfgang Elser, Frankenthal, and Manfred Ruske, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

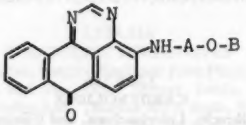
Filed Dec. 19, 1973, Ser. No. 426,368

Claims priority, application Germany, Dec. 29, 1972, 2263919

Int. Cl.² C07D *239/84*

U.S. Cl. 260—256.4 Q **7 Claims**

1. An anthrapyrimidine dye of the formula



in which

A is linear or branched saturated unsubstituted alkylene of two to eight carbon atoms, or —CH_2—CH_2—O—CH_2—CH_2—;

B is hydrogen or

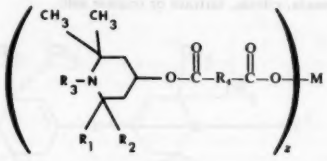
where X is linear or branched saturated alkyl of one to nine carbon atoms, a linear or branched saturated alkyl of one to nine carbon atoms in which one or two hydrogen atoms are substituted by chloro, bromo or phenoxy, cycloalkyl of five to eight carbon atoms, phenyl; phenyl in which one to three hydrogen atoms are substituted by chloro, bromo, fluoro, alkyl of one to three carbon atoms, trifluoromethyl, ethoxy and cyano, said phenyl substituents being identical or different, naphthyl, phenylalkyl of seven to ten carbon atoms, styryl, a pyridine ring, or —NH—R or —O—R where R is alkyl of one to six carbon atoms, cycloalkyl of six to eight carbon atoms, phenyl, or phenyl in which one to three hydrogen atoms are substituted by chloro, bromo, methyl, methoxy and phenoxy, said phenyl substituents being identical or different.

3,939,163
METAL SALTS OF HINDERED PIPERIDINE CARBOXYLIC ACIDS AND STABILIZED COMPOSITIONS

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,237
Int. Cl.² C07D 211/46
U.S. Cl. 260—270 C 10 Claims

1. A compound of the formula



wherein

R_1 and R_2 independently of each other are straight or singly branched-chain alkyl of formula
$-CH_3-(C_nH_{2n+1})$
where n is 0 to 5, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group,

R_3 is hydrogen, a straight-or singly branched-chain alkyl of formula
$-CH_3-(C_nH_{2n+1})$
where n is 0 to 11, β-methoxyethyl, alkenyl having 3 or 4 carbon atoms, propargyl, benzyl or methyl substituted benzyl,

R_4 is straight- or branched-chain alkylene having 1 to 4 carbon atoms,

M is a metal selected from the group consisting of nickel, manganese, zinc, iron, cobalt, tin and di-n-alkyl tin of up to 8 carbon atoms, and

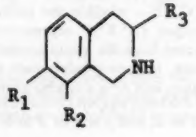
z has a value of from 1 to 4, the value of z being the same as the available valence of M.

3,939,164
7 AND 8-HALO SUBSTITUTED 1,2,3,4-TETRAHYDROISOQUINOLINE COMPOUNDS

Carl Kaiser, Haddon Heights, N.J., and Robert G. Pendleton, Elkins Park, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 8, 1974, Ser. No. 440,925
Int. Cl.² C07D 217/08, 217/00
U.S. Cl. 260—286 R 4 Claims

1. A compound of the formula:



in which:

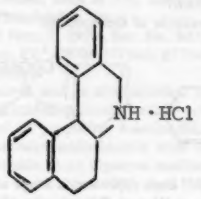
R_1 and R_3 are chloro, bromo or iodo, R_1 and R_3 being the same or different, or R_1 and R_2 are both fluoro and R_3 is hydrogen, methyl or ethyl or a pharmaceutically acceptable, acid addition salt thereof.

3,939,165
5,6,6a,6b,7,8-HEXAHYDROBENZ[a]PHENANTHRIDINE HYDROCHLORIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,589
Int. Cl.² C07D 215/58
U.S. Cl. 260—286 R 1 Claim

1. A compound of the formula:

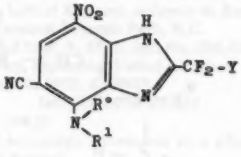


3,939,166
4-SUBSTITUTED-5-CYANO-7-NITRO-2-(α,α-DIFLUOROALKYL)BENZIMIDAZOLES

John L. Miesel, and David I. Wickiser, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 232,289, March 6, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,298
Int. Cl.² C07D 235/16
U.S. Cl. 260—293.6 9 Claims

1. Compound of the formula



wherein Y represents

a. hydrogen,
b. chlorine,
c. fluorine,
d. trifluoromethyl, or
e. pentafluoroethyl;

and wherein R^a and R_1 are either taken separately, in which case each independently represents one of the following, subject to the limitation that at least one of R^a and R^1 contains more than 1 carbon atom and that R^a and R^1 together contain less than 9 carbon atoms:

1. hydrogen
2. alkyl
3. alkenyl containing more than 2 carbon atoms,
4. alkynyl containing more than 2 carbon atoms,
5. (fluoroalkyl)methyl wherein alkyl is C_1-C_7, both inclusive, and bears at least one fluorine atom,
6. cycloalkyl of C_3-C_8, both inclusive

7. cycloalkylloweralkyl, wherein cycloalkyl is of C_3–C_6, both inclusive, and loweralkyl is of C_1–C_4, both inclusive, or
8. loweralkylcycloalkyl, wherein cycloalkyl and loweralkyl are as defined in the preceding candidate moiety;

or R^9 and R^1 are taken together, in which case they jointly constitute, with the nitrogen atom to which they are attached, piperidino; and the alkali metal and alkaline earth metal salts thereof.

3,939,167

3-(2-METHYLTHIO-2-TERTIARY AMINOACETYL)-5-PHENYLISOXAZOLES

Shoichi Hirai, Ibaraki, and Kyozo Kawata, Kawanishi, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

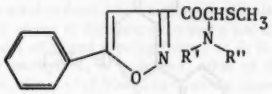
Filed Aug. 21, 1973, Ser. No. 389,636

Claims priority, application Japan, Aug. 22, 1972, 47-83916

Int. Cl.² C07D 295/12

U.S. Cl. 260—293.67 **8 Claims**

1. A phenylisoxazole of the formula:



wherein R′ and R″ each represent a lower alkyl group of 1 to 3 carbon atoms or R^1 and R^{11} may be combined with the nitrogen atom to which they are attached to form a pyrrolidino or piperidino group.

3,939,168

4-PIPERIDINE ACETAMIDES

Barry Cook, Manchester, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

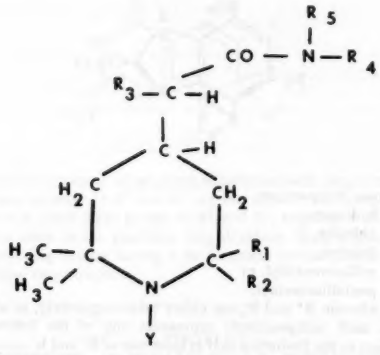
Filed July 17, 1973, Ser. No. 380,040

Claims priority, application United Kingdom, July 28, 1972, 35487/72

Int. Cl.² C07D 211/32

U.S. Cl. 260—293.77 **18 Claims**

1. A compound of the formula I



wherein

Y is straight- or branched alkyl having from 1 to 12 carbon atoms, alkenyl having from 3 to 12 carbon atoms, benzyl, α-methyl-benzyl, p-methyl benzyl, α, p-dimethylbenzyl, α-napthylmethyl, 2-phenyl- 2-hydroxyethyl or a group R_7-CH OH-CH_2- wherein R_7 is hydrogen, alkyl having from 12 to 4 carbon atoms or phenyl.

R_1 and R_2 are the same or different and each is straight- or branched alkyl having from 1 to 12 carbon atoms or R_1 and R_2, together with the carbon atom to which they are attached, form a cycloalkyl group having from 5 to 12 carbon atoms.

R_3 and R_5 are independently hydrogen, straight-or branched alkyl having from 1 to 4 carbon atoms, benzyl, α-methyl benzyl, α, p- dimethylbenzyl or a cycloalkyl group having 5 or 6 carbon atoms.

R_4 is hydrogen, a hydrocarbyl group having from 1 to 20 carbon atoms and being either unsubstituted or substituted by halogen or interrupted by one or more oxygen or sulphur atoms or a salt of the amine function of a compound of formula I said salt being selected from the phosphate, carbonate, sulphate, chloride, acetate, stearate, malonate, citrate, tartrate or oxalate salt.

3,939,169

ALKYLENE BIS(PYRIDINIUMAREYLENE QUATERNARY SALTS)

Philip Neil Edwards, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

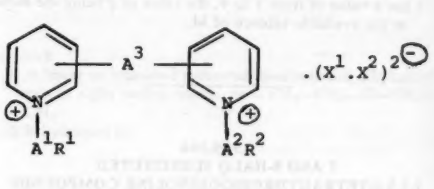
Division of Ser. No. 234,648, March 14, 1972, Pat. No. 3,786,058. This application Dec. 27, 1973, Ser. No. 428,692

Claims priority, application United Kingdom, Mar. 29, 1971, 8071/71

Int. Cl.² C07D 213/40

U.S. Cl. 260—294.8 R **6 Claims**

1. A pyridine derivative of the formula:



wherein R^1 and R^2 which may be the same or different are each alkyl having 8 to 14 carbon atoms, n-undec-10-yl, 2-n-hexyloxyethyl, 2-(2-butoxyethoxy)ethyl, 3,4-dichlorophenyl, 4-chlorobenzyl, 2,4-dichlorobenzyl or 2-naphthylmethyl; A^1 and A^2 are each a direct linkage or a linking group of the formula —CH_2CO.NH— wherein the methylene is joined to the pyridine nitrogen; $(X^1.X^2)^{2-}$ represents two monoanions or a dianion selected from the group consisting of two halide, methanesulphonate, toluene-p-sulphonate or acetate ions or the sulphate dianion; and A^3 is a linking group of the formula:

$$-(CH_2)_nNH.CO.NH(CH_2)_yNH.CO.NH(CH_2)_n-$$

wherein n is 0, 1 or 2; and y is 0 or 2 to 6.

3,939,170

DEHYDRO PYRIDINYL SULFIDES, SULFOXIDES AND SULFONES

Donald Richard Randell, Stockport, and Malcolm John Smith, Marple Stockport, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

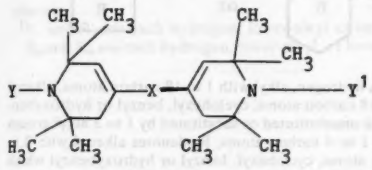
Filed June 3, 1974, Ser. No. 475,717

Claims priority, application United Kingdom, June 8, 1973, 27354/73

Int. Cl.² C07D *211/70*

U.S. Cl. 260—294.8 F 10 Claims

1. A compound having the formula:



I

wherein X is S, SO or SO_2 and Y and Y^1 are the same or different and each is H, OH, O or a straight- or branched alkyl having from 1 to 4 carbon atoms, and salts thereof when Y and Y^1 are other than O, said salts being formed with the acids selected from hydrogen chloride, sulfuric acid, phosphoric acid, carbonic acid, acetic acid, maleic acid, oxalic acid and tartaric acid.

3,939,171

2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Freidrich Bossert, both of Wuppertal-Elberfeld; Wülf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

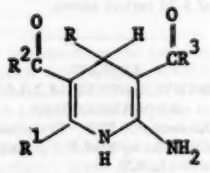
Division of Ser. No. 455,304, March 27, 1974, Pat. No. 3,857,849, which is a division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application Oct. 24, 1974, Ser. No. 517,732

Claims priority, application Germany, Mar. 6, 1972, 2210674

Int. Cl.² C07D *213/55*

U.S. Cl. 260—294.8 D 3 Claims

1. A compound of the formula:



wherein

R is a heterocyclic ring selected from the group consisting of pyridyl, thienyl, furyl and pyrryl, said heterocyclic ring being unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno;

R^1 is phenyl or pyridyl;

R^2 is lower alkoxy, lower alkoxy(lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl)amino; and

R^3 is lower alkoxy, lower alkoxy(lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl)amino.

3,939,172

4-AMINOTHIAZOLE

Gregory Gallagher, Jr., Collegeville, and William D. Kingsbury, West Chester, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Nov. 7, 1974, Ser. No. 521,707

Int. Cl.² C07D *277/40*, *277/46*

U.S. Cl. 260—306.8 R 10 Claims

1. 4-Aminothiazole and its acid addition salts.

4. 4-Trifluoroacetamidothiazole and its acid addition salts.

7. The method of preparing 4-aminothiazole comprising reacting 4-trifluoroacetamidothiazole with an ammonium or alkali metal hydroxide in an aqueous medium at from about room temperature up to about 40°C. until the hydrolysis reaction is substantially complete.

10. The method of preparing 4-aminothiazole comprising reacting 2-bromo-4-trifluoroacetamidothiazole under low pressure catalytic hydrogenation conditions in the presence of a noble metal catalyst to give 4-trifluoroacetamidothiazole then reacting said 4-trifluoroacetamidothiazole with sodium or potassium hydroxide in an aqueous medium at from about 30°–35°C. for about 4–8 hours.

3,939,173

SUBSTITUTED CARBONYL COMPOUNDS

Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Sept. 5, 1973, Ser. No. 394,423

Claims priority, application United Kingdom, Sept. 6, 1972, 41431/72; Feb. 20, 1973, 8200/73

Int. Cl.² C07D *257/04*

U.S. Cl. 260—308 D 9 Claims

1. 2,7-Di-(5-tetrazolyl) fluorenone or a pharmaceutically acceptable salt thereof.

3,939,174

CERTAIN 3-OXO-2-ARYL-5,6-DIHYDRO-4(H)-PYRROLO-(1,2-C)(1,2,3)TRIAZOLIUM COMPOUNDS

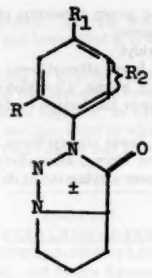
Marwan J. Abu-El-Haj, Groton, and James W. McFarland, Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 395,713, Sept. 10, 1973, which is a continuation-in-part of Ser. No. 170,996, Aug. 11, 1971, abandoned. This application Dec. 13, 1974, Ser. No. 532,495

Int. Cl.² C07D *249/06*, *471/04*, *513/04*

U.S. Cl. 260—308 A 2 Claims

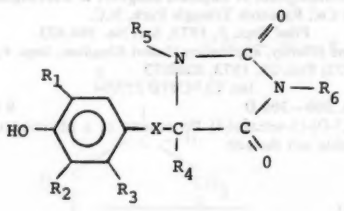
1. A compound of the formula



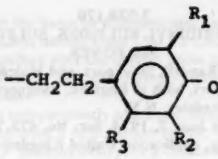
wherein
R is hydrogen, halogen, methyl, or nitro;
R_1 is halogen; and
R_2 is hydrogen, halogen, or nitro.

3,939,175
HYDROXYPHENYLATED HYDANTOINS
Andreas Schmidt, Reinach, Switzerland; Janet B. Peterson, Yonkers, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation-in-part of Ser. No. 357,744, May 3, 1973, abandoned. This application May 14, 1974, Ser. No. 469,717
Int. Cl.² C07D *49/32*
U.S. Cl. 260—309.5 **8 Claims**

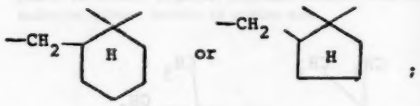
1. A compound of the formula



wherein R_1 denotes alkyl with 1 to 8 carbon atoms, cycloalkyl with 6 to 8 carbon atoms or aralkyl with 7 to 9 carbon atoms; R_2 denotes hydrogen, alkyl with 1 to 8 carbon atoms, cycloalkyl with 6 to 8 carbon atoms or aralkyl with 7 to 9 carbon atoms; R_3 denotes hydrogen or methyl; X denotes a direct bond, alkylene with 1 to 18 carbon atoms, which can be interrupted by oxygen or sulphur atoms, or the radical $—OCH_2—$ wherein the oxygen atom is bonded to the phenol radical; R_4 denotes hydrogen, alkyl with 1 to 17 carbon atoms, alkenyl with 2 to 17 carbon atoms, thiaalkyl with 3 to 21 carbon atoms, oxaalkyl with 3 to 21 carbon atoms, cyclohexyl, benzyl, phenyl, alkylphenyl with 7 to 14 carbon atoms, alkoxyphenyl with 7 to 24 carbon atoms, chlorophenyl, dichlorophenyl, naphthyl or a group



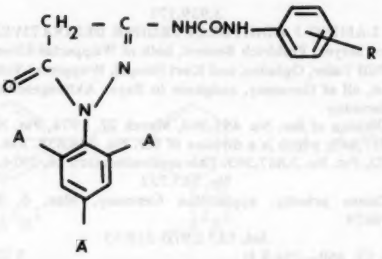
or X and R_4 conjointly with the carbon atom in the 5-position of the hydantoin ring denote one of the radicals



R_5 denotes hydrogen, alkyl with 1 to 18 carbon atoms, alkenyl with 3 to 18 carbon atoms, cyclohexyl, benzyl or hydroxybenzyl which is unsubstituted or substituted by 1 to 3 alkyl groups each with 1 to 4 carbon atoms; R_6 denotes alkenyl with 3 to 18 carbon atoms, cyclohexyl, benzyl or hydroxybenzyl which is unsubstituted or substituted by 1 to 3 alkyl groups each with 1 to 4 carbon atoms.

3,939,176
MAGENTA COUPLERS
Mario Gandino, Ferrania, and Paolo Beretta, Liberta Ferrania, both of Italy, assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Division of Ser. No. 268,449, July 3, 1972, Pat. No. 3,844,794, which is a continuation of Ser. No. 43,031, June 3, 1970, abandoned. This application July 22, 1974, Ser. No. 490,733
Int. Cl.² C07D *231/08*
U.S. Cl. 260—310 A **4 Claims**

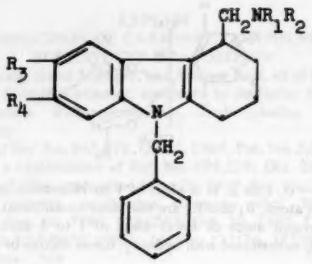
1. A color coupler of the formula:



wherein two of the A groups are halogen, the remaining A group is alkoxy of 1-18 carbon atoms, and R and R^1 are alkoxy or alkyl groups of 5-20 carbon atoms.

3,939,177
4-AMINOMETHYL-9-BENZYL-1,2,3,4-TETRAHYDROCARBAZOLES
Ernest John Alexander, East Greenbush, and Aram Mooradian, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.
Filed Nov. 22, 1972, Ser. No. 308,674
Int. Cl.² C07D *209/86*
U.S. Cl. 260—315 **8 Claims**

1. 4-$R_1R_2NCH_3$-9-benzyl-6-R_5-7-R_4-1,2,3,4-tetrahydrocarbazole having the formula:



wherein

R_1 and R_2 are each hydrogen, lower-alkyl or benzyl, and R_3 and R_4 are each hydrogen, lower-alkyl, or lower-alkoxy.

3,939,178

CERTAIN PYRANO [3,4-B]INDOLES AND THIOPYRANO[3,4-B]INDOLES

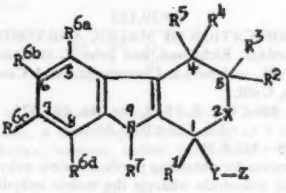
Christopher A. Demerson, St. Laurent; Leslie G. Humber; Thomas A. Dobson, both of Dollard des Ormeaux, and Ivo L. Jirkovsky, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 148,895, June 1, 1971, abandoned. This application Sept. 15, 1972, Ser. No. 289,714

Int. Cl.² C07D *495/04, 493/04*

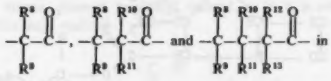
U.S. Cl. 260—326.28 **58 Claims**

1. A compound of the formula Ia



Ia.

in which R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, lower cycloalkyl, phenyl, benzyl and 2-thienyl, R^2, R^3, R^4 and R^5 are the same or different and are each selected from the group consisting of hydrogen and lower alkyl, R^{6a}, R^{6b}, R^{6c}, and R^{6d} are the same or different and selected from the group consisting of hydrogen, lower alkyl, hydroxy, lower alkoxy, benzyloxy, lower alkanoyloxy, nitro, halo, mercapto, lower alkylthio, trifluoromethyl, amino and sulfamoyl, R^7 is selected from the group consisting of hydrogen, lower alkyl and lower alkenyl, X is selected from the group consisting of oxy and thio, Y is selected from the group consisting of carbonyl,



which each of R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} is hydrogen or lower alkyl, and Z is selected from the group consisting of hydroxy and lower alkoxy, or a pharmaceutically acceptable salt thereof.

3,939,179

CONTINUOUS PRODUCTION OF THIOPHENE FROM BUTANE

Thomas Robert Bell, Devon, and Perrin Gary Smith, Chester Springs, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 29, 1973, Ser. No. 392,594

Int. Cl.² C07D *333/10*

U.S. Cl. 260—332.8 **4 Claims**

1. In a continuous catalytic gas-phase process of reacting hydrogen sulfide with one or more C_4 hydrocarbons selected from the group consisting of normal butane, normal butenes and mixtures thereof to produce thiophene, by-product carbon disulfide and by-product hydrogen comprising

continuously preheating the said C_4 hydrocarbon reactant within the range 500° to 900°F. and separately preheating the hydrogen sulfide reactant within the range of 900° to 1100°F. and

thereafter introducing the said reactant gases to a dehydrogenation catalytic reactor maintained at a temperature within the range of 900° to 1100°F.

continuously withdrawing a product stream from the said reactor containing thiophene, carbon disulfide, hydrogen, excess hydrogen sulfide and unreacted C_4 hydrocarbons, separating thiophene and carbon disulfide from the reactor product stream while recycling excess hydrogen sulfide and unreacted C_4 hydrocarbons to the said reactor and regenerating the dehydrogenation catalyst when the conversion to thiophene falls off,

the improvement consisting of introducing the said reactant gases at a mole ratio of hydrogen sulfide to C_4 hydrocarbon ranging from about 15 to 1 to about 20 to 1 to an adiabatic reactor containinng a dehydrogenation catalyst while

simultaneously introducing sulfur vapor to the catalyst to react with by-product hydrogen and thereby to generate heat in an amount sufficient to maintain the catalyst temperature within the range of 900° to 1100°F.

3,939,180

PENICILLIN ESTERS

Harry Ferres, and John Peter Clayton, Horsham, both of England, assignors to Beecham Group limited, United Kingdom

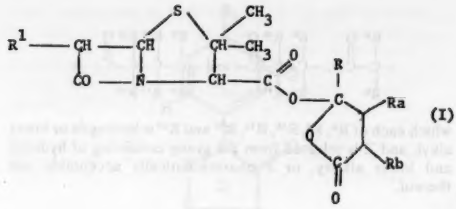
Division of Ser. No. 524,776, Nov. 18, 1974, which is a continuation of Ser. No. 285,941, June 5, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 530,833

Claims priority, application United Kingdom, June 9, 1971, 19604/70

Int. Cl.² C07D *499/28*

U.S. Cl. 260—239.1 **4 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable acid addition salt thereof:



(I)

wherein R is hydrogen, methyl or phenyl; Ra and Rb are hydrogen or lower alkyl; and R^1 is an acylamino group selected from phenylacetamido; p-hydroxyphenylacetamido; p-heptylphenylacetamido; phenoxyacetamido; α-phenoxypropionamido; α-phenoxybutyamido; 2,6-dimethoxyphenylacetamido; 3-phenyl-5-methyl-isoxazole-4-carbamido; 3-(2-chlorophenyl)-5-methyl-isoxazole-4-carbamido; 3-(2,6-dichlorophenyl)-5-methyl-isoxazole-4-carbamido; 3-(2-chloro-6-fluorophenyl)-5-methyl-isoxazole-4-carbamido; 2-ethoxynapthyl-1-carbamido; o, m or p-aminophenylacetamido; 3-carboxyquinoxalin-2-carbamido; 2-furylacetamido; 2-thienylacetamido; 3-thienylacetamido; 3-pyridylacetamido; isothiazolylacetamido; 3-hexenamido; 2-biphenylamido; n-hexanamido; n-octanamido; propionamido; α-aminophenylacetamido; α-amino-2-thienylacetamido; α-amino-3-thienylacetamido; α-methylaminoacetamido; α-amino-2- or -3- or -4-chlorophenylacetamido; α-amino-2-methoxyphenylacetamido; α-amino-2,4-dichlorophenylacetamido; α-amino-3,4-dichlorophenylacetamido; α-amino-α-methylphenylacetamido; α-amino-4-hydroxyphenylacetamido; α-amino-3-chloro-4-hydroxyphenylacetamido; α-methylphenylacetamido; α-hydroxyphenylacetamido; α-carboxyphenylacetamido; α-(5-tetrazolyl)phenylacetamido; α-guanidino-2-thienylacetamido; α-guanidino-4-hydroxyphenylacetamido; α-guanidino-4-hydroxy-2- or -3-methylphenylacetamido; α-carboxy-3-thienylacetamido; α-sulphaminophenylacetamido; α-sulphamino-3-thienylacetamido; α-(N-methylsulphamino)-phenylacetamido; α -azidophenylacetamido; 1-aminocyclohexylcarbamido; 1-aminocyclopentylcarbamido; 5-amino-5-carboxypentanamido; α-phenoxyphenylacetamido; α-phenyl-β-sulphaminopropionamido; α-sulphophenylacetamido; α-guanidinophenylacetamido; β-amino-β-cyclohexylpropionamido and α-(benzyloxycarbonyl)phenylacetamido.

3,939,181

INTERMEDIATES FOR THE PREPARATION OF PYRIMIDINE COMPOUNDS

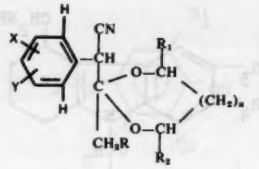
John W. Mentha, Washington; Janice V. Shaffner, Greenville, and Ronald M. Cresswell, Raleigh, all of N.C., assignors to Burroughs Wellcome Co., N.C.

Division of Ser. No. 256,339, May 24, 1972, Pat. No. 3,849,416, which is a continuation-in-part of Ser. No. 177,502, Sept. 2, 1971, abandoned. This application Aug. 5, 1974, Ser. No. 494,721

Int. Cl.[2] C07D *317/30, 319/06, 321/04*

U.S. Cl. 260—340.7 **18 Claims**

1. A compound of the formula



where $n = 0$, 1 or 2, R is alkyl of 1 to 10 carbon atoms or a hydrogen atom, R_1 and R_2 are the same or different and each is a hydrogen atom or lower alkyl of 1 to 4 carbon atoms optionally substituted with hydroxy, lower alkoxy or a halogen atom,

X is a halogen atom or nitro, Y is a halogen atom or a hydrogen atom, or R_1 and R_2 taken together can complete a 5 to 7 member saturated ring when $n = 0$.

3,939,182

PROSTAGLANDIN E_1 INTERMEDIATE 6α-CARBOXY-5α(1-HYDROXYETHYL)-2-CYCLOHEXENE-1-HEPTANOIC ACID,γ-LACTONE, AND LOWER ALKYL OR ARALKYL ESTERS THEREOF

Chan-Hwa Kuo, South Plainfield; David Taub, Metuchen, and Norman L. Wendler, Summit, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 406,752, Oct. 15, 1973, which is a division of Ser. No. 290,590, Sept. 20, 1972, Pat. No. 3,850,952. This application Feb. 11, 1975, Ser. No. 549,123

Int. Cl.[2] C07D *493/00*

U.S. Cl. 260—343.3 R **2 Claims**

1. 6α-Carboxy-5α(1-hydroxyethyl)-2-cyclohexene-1-heptanoic acid, γ-lactone, 1–6 carbon loweralkyl, or 6–10 carbon aromatic hydrocarbon substituted lower alkyl ester.

3,939,183

PURIFICATION OF MALEIC ANHYDRIDE

John D. Gardner, Richmond, and John F. Manning, Albany, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 5, 1973, Ser. No. 404,076

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.8 M **9 Claims**

1. In a process for obtaining purified maleic anhydride from crude maleic anhydride wherein the maleic anhydride is produced by steps comprising oxidizing a hydrocarbon feedstock over a catalyst comprising vanadium and phosphorus oxides to obtain an effluent gas containing maleic anhydride, and recovering the crude maleic anhydride from the effluent gas by contacting the effluent gas with an organic absorbent followed by stripping the crude maleic anhydride out of the absorbent, and wherein the crude maleic anhydride is treated by steps comprising heating the crude maleic anhydride, distilling the crude maleic anhydride, and withdrawing a purified maleic anhydride overhead product, the improvement which comprises combining, contacting and heating an alkaline earth or transition metal chloride and P_2O_5 or alkali or alkaline earth metal perborate with the crude anhydride before distilling the crude anhydride to obtain overhead produce maleic anhydride.

3,939,184

PRODUCTION OF CARBONYL COMPOUNDS SUBSTITUTED IN α-POSITION

Horst Koenig; Horst Metzger, and Werner Reif, all of Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

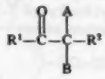
Division of Ser. No. 863,770, Oct. 2, 1969, Pat. No. 3,821,277, which is a continuation of Ser. No. 505,229, Oct. 26, 1965, abandoned. This application Mar. 26, 1973, Ser. No. 344,632

Claims priority, application Germany, Oct. 30, 1964, 1226562; Oct. 30, 1964, 1226563; Oct. 30, 1964, 1238454

Int. Cl.[2] C07C 69/66, 117/00, 121/76, 122/00

U.S. Cl. 260—349 1 Claim

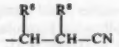
1. A process for the manufacture of carbonyl compounds substituted in α-position and having the formula:



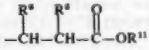
where R^1 is an alkyl radical having 1 to 12 carbon atoms, an aralkyl radical having 7 to 8 carbon atoms, a phenyl, o-toluyl, m-toluyl, p-toluyl, α-naphthyl or β-naphthyl radical which may bear 1 chlorine atom or 1 methoxy group as substituents, the group

where R^3 and R^4 are selected from the group consisting of hydrogen, alkyl of 1 to 10 carbon atoms, cyclohexyl, benzyl, phenyl, toluyl, p-chlorophenyl, and naphthyl or the radical $-OR^5$ where R^5 is alkyl of 1 to 4 carbon atoms, R^2 is hydrogen, the radical

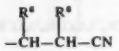
where R^1 has the meaning given above, the radical



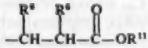
or the radical



where R^6 is hydrogen or methyl and R^{11} is alkyl of 1 to 4 carbon atoms, A is hydrogen, linear alkyl of 1 to 10 carbon atoms, chlorine, bromine, iodine, the radical



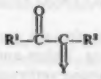
or the radical



where R^6 and R^{11} have the meanings given above, B is chlorine, bromine, iodine, hydroxy, sulfhydryl, thiocyano, cyanato, nitro, azido, the radical $-XR^7$ where X is oxygen, sulfur or the radical $-SO_2-$ and R^7 is alkyl having 1 to 4 carbon atoms, phenyl, naphthyl, benzyl, or if X is oxygen or sulfur, the acyl radical

where R^8 is hydrogen, phenyl or toluyl, or the group

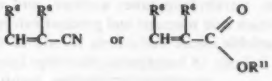
where R^3 and R^4 have the meanings given above, which comprises reacting a sulfur ylide having the formula:



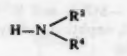
where R^1 and R^2 have the meanings given above and Y is the radical

or the radical

where R^9 and R^{10} are linear alkyl groups having 1 to 4 carbon atoms or phenyl radicals, with a solution which contains both an electrophilic agent A′ that is converted into said radical A and a nucleophilic agent B′ that is converted into said radical B or contains a compound of the type AB capable of reacting both as A′ and as B′, or first with a solution which contains said electrophilic agent A′ and then with a solution which contains said nucleophilic agent B′, at temperatures between 0° and 150°C, A′ being chlorine, bromine, iodine, cyanogen, cyanogen chloride, cyanogen bromide, an alkyl bromide, iodide, sulfate or sulfonate of 1 to 10 carbon atoms, an aralkyl bromide, iodide, sulfate or sulfonate of from 6 to 15 carbon atoms, or an α,β-olefinically unsaturated carboxylic nitrile or ester having the formula



where R^6 and R^{11} have the meanings given above, the solution of said electrophilic agent A′ containing an amount of protons at least equivalent to the amount of nitrile or ester to be reacted if A′ is one of the said carboxylic acid derivatives, and B′ in said solution being a chloride, bromide, iodide, hydroxide, alkanolate having 1 to 4 carbon atoms, phenolate, sulfide, phenyl sulfide, ethyl sulfinate, naphthylsulfinate, phenyl sulfinate, benzyl sulfinate, cyanide, thiocyanide, azide or nitrite of an alkali metal, an alkaline earth metal or ammonium or being an amine having the formula



where R^3 and R^4 have the meanings given above, water, hydrogen sulfide or a compound having the formula $H - X - R^7$ where R^7 and X have the meanings given above.

3,939,185

PROCESS FOR THE PREPARATION OF 1-NITRO-ANTHRAQUINONE WHICH IS PRACTICALLY FREE OF 1,5-DINITRO-ANTHRAQUINONE

Axel Vogel, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 30, 1973, Ser. No. 420,370

Claims priority, application Germany, Dec. 2, 1972, 2259074

Int. Cl.² C07C *79/37*

U.S. Cl. 260—369 **11 Claims**

1. In a known process for the purification of 1-nitro-anthraquinone by isolating 1-nitro-anthraquinone from an impure composition containing anthraquinone nitration products and reactants primarily containing 1-nitro-anthraquinone and containing as an impurity 1,5-dinitro-anthraquinone, the improvement comprising removing 1,5-dinitro-anthraquinone by adding to said composition a mixture of concentrated nitric acid, containing at least 75% by weight HNO_3 and not more than 25% by weight H_2O and an inert organic solvent which is miscible with the concentrated nitric acid and is selected from the group consisting of aliphatic and alicyclic hydrocarbons with up to 12 carbon atoms, and halogen derivatives thereof, wherein the relative quantities of nitric acid and inert organic solvent in said mixture as well as the total quantities in said composition, are such that the solubility of 1-nitroanthraquinone and anthraquinone in the mixture of nitric acid and organic solvent is greater that the sum of the partial solubilities in the individual components of the solvent mixture and subsequently, the undissolved 1,5-dinitro-anthraquinone containing constitutent is separated from the solution thus formed.

3,939,186

PROCESS FOR PRODUCING ETHERS OF STEROIDS

Ken-ichi Wakabayashi, and Susumu Kanno, both of Machida, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Dec. 6, 1974, Ser. No. 530,151

Claims priority, application Japan, Dec. 29, 1973, 49-1184

Int. Cl.² C07J *9/00, 1/00*

U.S. Cl. 260—397.4 **12 Claims**

1. A process for producing estrogenic steroid ethers which comprises admixing an alkali, a reactant estrogenic steroid having a hydroxyl group attached directly to an aromatic ring of the estrogenic steroid nucleus and a dialkyl sulfate in the presence of a hydrophilic solvent selected from the group consisting essentially of dioxane, tetrahydrofuran, methyltetrahydrofuran, tetrahydropyrane, acetone, and methyl ethyl ketone, in which said reactant and product estrogenic steroid are readily soluble.

3,939,187

15α,-SULFONYLOXY-12β-HYDROXYPREGNANES AND PROCESS FOR THE PREPARATION THEREOF

Hans-Günter Lehmann, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

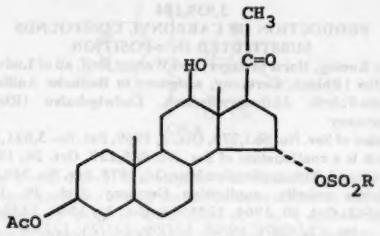
Filed July 2, 1974, Ser. No. 485,062

Claims priority, application Germany, July 4, 1973, 2334559

Int. Cl.² C07J *5/00*

U.S. Cl. 260—397.45 **10 Claims**

1. A 15α-sulfonyloxy-12β-hydroxypregnane of the formula



wherein Ac is the acyl radical of an alkyl, cycloalkyl, cycloalkylalkyl, carbocyclic aryl or carbocyclic aralkyl hydrocarbon carboxylic acid of up to 8 carbon atoms and R is alkyl of 1–8 carbon atoms, cycloalkyl of 3–8 carbon atoms or carbocyclic aryl of 6–18 carbon atoms.

3,939,188

PREPARATION OF ZEROVALENT PHOSPHINE SUBSTITUTED RHODIUM COMPOUNDS AND THEIR USE IN THE SELECTIVE CARBONYLATION OF OLEFINS

Gary B. McVicker, Westfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 24, 1972, Ser. No. 237,891

Int. Cl.² C07F *15/00*

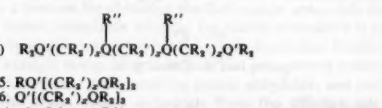
U.S. Cl. 260—429 R **7 Claims**

1. A composition of matter, said composition being characterized by one of the following formulae:

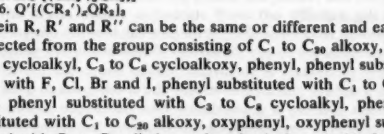
$[(L)(L')Rh^o]_x[L_3Rh^o]_z$, $[L'_xRh^o]_z$, $[L''Rh^o]_z$

where L is a monodentate ligand, L′ is a bidentate ligand and L″ is a tri or quadra-dentate ligand, wherein L, L′ and L″ can be the same or different and each is one selected from the group consisting of:

1. R_3Q, $R_3R'Q$, $(RR'R'')Q$
2. $R_3Q(CR_2')_xQ'R_2$



3) $R_3Q(CR_2')_xQ'(CR_2')_xQR_2$



4) $R_3Q'(CR_2')_xQ(CR_2')_xQ(CR_2')_xQ'R_2$

5. $RQ'[(CR_2')_xQR_2]_2$
6. $Q'[(CR_2')_xQR_2]_2$

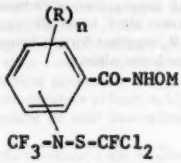
wherein R, R′ and R″ can be the same or different and each is selected from the group consisting of C_1 to C_{20} alkoxy, C_3 to C_8 cycloalkyl, C_3 to C_8 cycloalkoxy, phenyl, phenyl substituted with F, Cl, Br and I, phenyl substituted with C_1 to C_{20} alkyl, phenyl substituted with C_3 to C_8 cycloalkyl, phenyl substituted with C_1 to C_{20} alkoxy, oxyphenyl, oxyphenyl substituted with C_1 to C_{20} alkyl, oxyphenyl substituted with C_3 to C_8 cycloalkyl, oxyphenyl substituted with F, Cl, Br and I, oxyphenyl substituted with C_1 to C_8 cycloalkoxy; Q and Q′ can be the same or different and each is selected from the group consisting of P, As and Sb; and *x* is an integer ranging from 1 to 5.

3,939,189
N-FLUORODICHL OROMETHYLTHIO)-N-(TRIFLUOROMETHYL)-AMINOBENZHYDROXAMIC ACIDS SALTS

Engelbert Kühle, Berg. Gladbach; Erich Klauke, Odenthal; Helmut Kaspers, and Scheinppflug, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 19, 1974, Ser. No. 443,882
Claims priority, application Germany, Mar. 10, 1973, 2311983
Int. Cl.² C07F 3/06
U.S. Cl. 260—429.9 4 Claims

1. An N-(fluorodichloromethylthio)-N-(trifluoromethyl)-amino-benzhydroxamic acid or salt of the formula



(I)

in which

R is halogen, nitro, alkyl or alkoxy with in either case up to 3 carbon atoms, or trifluoromethyl,

n is 0, 1 or 2, and

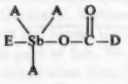
M is (hydrogen or one) an equivalent of (an alkali metal, alkaline earth metal or heavy metal) zinc, copper, iron, manganese or nickel.

3,939,190
GROUP V PENTAVALENT ATOM-CONTAINING COMPOSITIONS

Jeremy Musher, New York, N.Y., and Kai Su, Rutherford, N.J., assignors to Evelyn Musher, New York, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,499
Int. Cl.² C07F 9/90, 9/92
U.S. Cl. 260—446 11 Claims

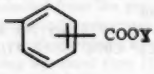
1. A polymerisable compound having the molecular formula



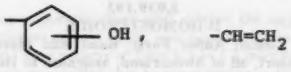
wherein:

a. A is a phenyl moiety or a lower alkyl moiety up to C_5,

b. D is selected from the group consisting of



wherein Y is selected from the group consisting of H, $-CH_3$ and $-CH_2CH_2OH$,



and $-CHCl-CH_2Cl$; and

c. and E is any of D herein or $-CH_3$.

3,939,191
PROCESS FOR METHANOL SYNTHESIS

Setunobu Asano, and Tadasi Nakamura, both of Niigata, Japan, assignors to Mitsubishi Gas Chemical Co. Inc., Tokyo, Japan

Filed Dec. 18, 1973, Ser. No. 425,830
Claims priority, application Japan, July 24, 1972, 47-73468
Int. Cl.² C07C 29/16
U.S. Cl. 260—449.5 2 Claims

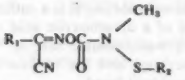
1. In a process for synthesizing methanol by the reaction of hydrogen and an oxide of carbon, the improvement which comprises carrying out the reaction in the presence of a catalyst comprising oxides of copper, zinc and boron in an atomic ratio of copper: zinc: boron of 20 to 70: 15 to 50: 0.3 to 5.3 at a reaction pressure of 20 to 500 kg/cm², a reaction temperature of 150° to 350°C and a space velocity of 2,000 to 5×10^4 hr^{-1}.

3,939,192
N-SULFENYLATE-N-METHYL-CARBAMIC ACID ESTERS OF 2-OXIMINO-ALKANECARBOXYLIC ACID NITRILES

Engelbert Kuhle, Berg.Gladbach; Peter Siegle, Cologne; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 11, 1974, Ser. No. 441,599
Claims priority, application Germany, Feb. 22, 1973, 2308660
Int. Cl.² C07C 119/00
U.S. Cl. 260—453 R 7 Claims

1. An N-sulfenylated-N-methylcarbamic acid ester of a 2-oximino-alkanecarboxylic acid nitrile of the formula

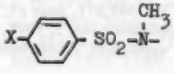


(I)

in which

R_1 is alkyl of one to six carbon atoms, or cyclohexyl or cycloheptyl optionally substituted by alkyl of one to four carbon atoms, and

R_2 is methyl substituted by at least one of fluoro of chloro, phenyl, methylphenyl, fluorophenyl, trifluoromethylphenyl, or the radical of the formula



in which

X is chlorine or methyl.

3,939,193

D-HOMOSTEROIDS

Leo Alig, Liestal; Andor Furst, Basel, and Marcel Muller, Frenkendorf, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

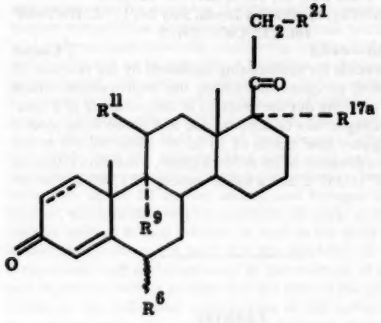
Filed Aug. 29, 1974, Ser. No. 501,558

Claims priority, application Switzerland, Sept. 26, 1973, 13764/73

Int. Cl.[2] C07C *141/12*, *49/45*

U.S. Cl. 260—457 12 Claims

1. A D-homosteroid of the formula



(I)

wherein R^6 is hydrogen, fluorine, chlorine, bromine or methyl; R^{11} is hydroxy; R^9 is hydrogen, fluorine, chlorine or bromine when R^{11} is hydroxy and R^9 is chlorine or bromine when R^{11} is fluorine or chlorine; R^{21} is halogen or R when R^{11} is hydroxy and R^{21} is halogen, hydroxy or hydrocarbon C_{1-15} acyloxy or R when R^{11} is fluorine or chlorine; R is a sulfate or phosphate radical or the radical of a dicarboxylic acid or tricarboxylic acid in the form of a water-soluble salt; R^{17a} is hydroxy or hydrocarbon C_{1-15} acyloxy; and the broken line in the 1,2-position denotes an optional bond.

3,939,194

BIS-2-AZOMETHINE PIGMENTS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Francois L'Eplattenier, Therwil; André Pugin, Riehen, and Laurent Vuitel, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

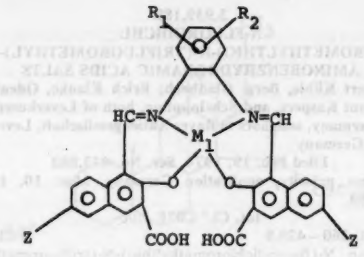
Division of Ser. No. 369,671, June 13, 1973, Pat. No. 3,875,200. This application Jan. 2, 1975, Ser. No. 538,429

Claims priority, application Switzerland, June 19, 1972, 9190/72

Int. Cl.[2] C07C *119/10*, *101/76*

U.S. Cl. 260—439 R 4 Claims

1. A bis-azomethine pigment of the formula



wherein N_1 is nickel, copper, zinc or cadmium, R_1 and R_2 are hydrogen, chloro, lower alkyl, lower alkoxy, phenyl, phenoxy, or wherein R_1 and R_2 together form a benzene ring, and Z is hydrogen, chloro, or lower alkoxy.

3,939,195

PREPARATION OF SILANOL CONTAINING ORGANOPOLYSILOXANES

Hans Joachim Lucking, Bergisch-Neukirchen; Klaus Seyfried, Schildgen; Werner Buchner, Opladen-Luetzenkirchen, and Karl-Heinz Rudolph, Cologne-Stammheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 7, 1975, Ser. No. 539,150

Claims priority, application Germany, Jan. 24, 1974, 2403303

Int. Cl.[2] C07F *7/08*

U.S. Cl. 260—448.2 E 5 Claims

1. The process for the preparation of an organopolysiloxanol comprising contacting at least one organochlorosilane of the formula

$$(CH_3)_a(C_6H_5)_b(CH_2=CH-)_cSiCl_{4-a-b-c}$$

wherein

a, b and c is 0, 1, 2, or 3

and wherein

$$2 \leq a+b+c \leq 3$$

at a temperature of about −10° to 90° C with water containing NH_4Cl in an amount from 1 to 100% of its saturation concentration, the pH value of the aqueous solution being adjusted to between about 7.5 and 11.6 by introduction of NH_3, separating the hydrolyzate from the aqueous solution immediately after hydrolysis, and flushing the hydrolyzate with an inert gas, to remove NH_3 therefrom.

3,939,196

DIARYLCYCLOBUTANES

John E. Lawson; Ronnie D. Dennis, and Robert F. Majewski, all of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Feb. 20, 1974, Ser. No. 444,071

Int. Cl.[2] C07C *39/17*, *43/20*

U.S. Cl. 260—613 R 3 Claims

1. A compound selected from the group consisting of 1,3-bis(p-hydroxyphenyl)cyclobutane and the monomethyl ether thereof.

3,939,197

PROCESS FOR THE PREPARATION OF ALKALINE SULFATE ESTERS OF N-ALKYL-SUBSTITUTED HYDROXYPOLYALKOXYMETHYLCYCLOHEXENES

Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 277,835, Aug. 3, 1972, Pat. No. 3,859,324. This application Nov. 4, 1974, Ser. No. 520,693

Int. Cl.² C07C *141/12*

U.S. Cl. 260—458 7 Claims

1. A process for the preparation of a biodegradable detergent which comprises the steps of:

a. condensing butadiene with allyl alcohol in a Diels-Alder reaction at a temperature in the range of from about 50° to 190° C. and a pressure in the range of from atmospheric to about 100 atmospheres to form hydroxymethylcyclohexene;

b. ring alkylating said hydroxymethylcyclohexene with a 3 to 20 carbon atom 1-alkene in the presence of an organic peroxy free-radical generating compound and hydrogen chloride at a temperature at least as high as the decomposition temperature of said free-radical generating compound;

c. alkoxylating the resultant n-alkyl-substituted hydroxymethylcyclohexene with an alkoxylating agent selected from the group consisting of ethylene oxide and propylene oxide at a temperature in the range of from about 20° to 125° C. and at a pressure of from about 50 to about 1000 pounds per square inch to form an n-alkyl-substituted hydroxypolyalkoxymethylcyclohexene;

d. sulfating said n-alkyl-substituted hydroxypolyalkoxymethylcyclohexene with a sulfating agent at a temperature of from about 0° to about 60° C. to form the sulfate ester thereof;

e. neutralizing said sulfate ester with a neutralizing agent to form the alkaline sulfate ester of said n-alkyl-substituted hydroxypolyalkoxymethylcyclohexene; and

f. recovering said alkaline sulfate ester.

3,939,198

CHLORINATED NAPHTHALENE ESTERS

Grover L. Farrar, Westfield, N.J., and Phillip W. Storms, Dickinson, Tex., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 529,221, Feb. 23, 1966, abandoned. This application May 6, 1970, Ser. No. 35,244

Int. Cl.² C07C *69/76*

U.S. Cl. 260—469 8 Claims

1. 1,4-dichloro-2,6-dicarbomethoxynaphthalene.

8. 1,3,4,7,8-pentachloro-beta-methyl naphthoate.

3,939,199

OXACYLATION OF OLEFINS IN THE GASEOUS PHASE

Hans Fernholz, Fischbach, Taunus; Friedrich Wunder, Florsheim am Main, and Hans-Joachim Schmidt, Falkenstein, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 215,901, Jan. 6, 1971, abandoned. This application June 22, 1973, Ser. No. 372,686

Claims priority, application Germany, Jan. 8, 1971, 2100778

Int. Cl.² C07C *67/04*

U.S. Cl. 260—469 1 Claim

1. In a process for oxacylating olefins in the gaseous phase wherein an olefin selected from the group consisting of ethylene, propylene and isobutylene is reacted with oxygen and a saturated aliphatic, cycloaliphatic, araliphatic or aromatic carboxylic acid having not more than 10 carbon atoms in the presence of a catalyst consisting essentially of palladium or palladium salts and an additive selected from the group consisting of gold, gold salts, cadmium, cadmium salts, bismuth, bismuth salts, alkaline earth metal salts and alkali metal salts, supported on a porous silicic acid carrier, the improvement which comprises: using a silicic acid support for said catalyst having a total pore volume of from 0.4 to 1.2 ml/g wherein the total pore volume attributable to pores having a diameter less than 30 A is less than 10% of the total pore volume.

3,939,200

ALIPHATIC ACYL-CONTAINING AMINE HYDROCHLORIDES

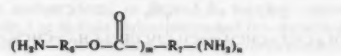
William D. Emmons, Huntingdon Valley, and Jerome F. Levy, Dresher, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 518,977, Jan. 6, 1966, Pat. No. 3,567,763. This application Sept. 4, 1970, Ser. No. 69,965

Int. Cl.² C07C *101/26*

U.S. Cl. 260—482 R 8 Claims

1. An amine having the formula



wherein *m* and *n* are either 1 or 2,

R_6 is an alkylene or cycloalkylene radical having 2 to 8 carbon atoms and up to one hetero oxygen or sulfur atom in the alkylene chain, and

R_7 is a divalent organic alkylene or cycloalkylene radical having 3 to 18 carbon atoms.

3,939,201

ESTERS

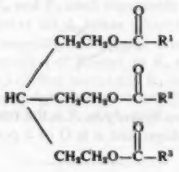
Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 9, 1973, Ser. No. 414,584

Int. Cl.² C07C *69/30*, *69/78*

U.S. Cl. 260—488 J 5 Claims

1. A triester of the following formula:



wherein R^1, R^2 and R^3 are alkyl or hydrocarbyl aryl groups having from 2 to 14 carbon atoms.

3,939,202

PROCESS FOR PREPARING POLYENE COMPOUNDS

Masanao Matsui, Tokyo; Seiichi Kitamura, Ibaraki, and Masahiro Morioka, Suita, all of Japan, assignors to Teikoku Chemical Industry Co., Ltd., Osaka, Japan

Filed Jan. 29, 1974, Ser. No. 437,557

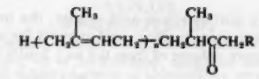
Claims priority, application Japan, Jan. 31, 1973, 48-12566; June 15, 1973, 48-67566; June 15, 1973, 48-67567

Int. Cl.² C07C *67/00*

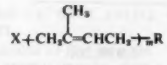
U.S. Cl. 260—489 9 Claims

1. A process for preparing a polyene compound which comprises:

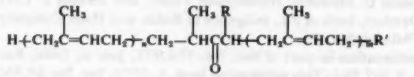
A. reacting a compound of the formula



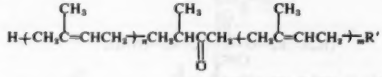
with a compound of the formula



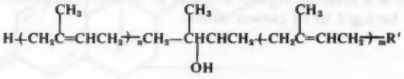
to form a compound of the formula



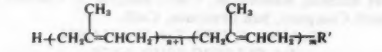
B. subjecting the product of (A) to hydrolysis and decarboxylation to form a compound of the formula



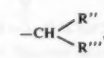
C. reducing the product of (B) to form a compound of the formula



D. reacting the product of (C) with a dehydrating agent to form a compound of the formula



where in each occurence above R is a group convertible into carboxyl on hydrolysis, R′ is protected or unprotected hydroxyl or a group of the formula



where R″ and R‴ are each carboxyl or a group convertible into carboxyl on hydrolysis, X is the residue of an acid, *m* is a positive integer and *n* is O or a positive integer.

3,939,203

CERTAIN SUBSTITUTED 2-HYDROXYBENZOPHENOXIMES AND THE PROCESS OF EXTRACTING COPPER THEREWITH

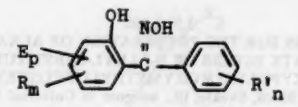
Phillip L. Mattison, Minneapolis, and Ronald R. Swanson, New Hope, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Mar. 18, 1968, Ser. No. 714,040

Int. Cl.² C07C *131/00*

U.S. Cl. 260—566 A **8 Claims**

1. A compound of the formula



in which R and R′ may be individually alike or different and are saturated aliphatic hydrocarbon groups of 1–25 carbon atoms, E is an electron withdrawing substituent, *p* is 1, 2, 3 or 4, *m* is 0 or a whole integer up to 4-*p* and *n* is 0, 1, 2, 3 or 4, said compound having a total of 3–25 carbon atoms in R_m and R'_n and said electron withdrawing substituent E_p (1) having an electron withdrawing capacity such that a phenol containing only said substituent has an acid ionization constant Ka of at least about 50×10^{-10} and (2) being so selected and positioned on the aromatic ring to substantially increase the efficiency of the compound as a copper extractant from aqueous solutions having a pH of less than about 1.0.

3,939,204

RADIOACTIVE FUNCTIONAL DIAGNOSTIC AGENTS

Götz Buttermann, Ottobrunn, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

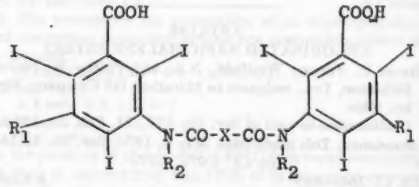
Filed June 4, 1973, Ser. No. 366,461

Claims priority, application Germany, Dec. 22, 1972, 2264002; Jan. 10, 1973, 2300966

Int. Cl.² C07C *103/30*

U.S. Cl. 260—518 A **21 Claims**

1. A radioactive compound selected from the group consisting of dicarboxylic acid anilides of the formula



wherein

1–6 of said iodine atoms are in the form of a radioactive iodine isotope;

R_1 is hydrogen, carboxyl, N-alkanoyl, N-alkanoylaminomethyl, N-alkyl-N-alkanoylamino or

wherein R_3 and R_4 are each hydrogen, lower alkyl or hydroxyalkyl;

R_2 is hydrogen, lower alkyl or hydroxyalkyl;

X is alkylene of 1–14 carbon atoms which can be interrupted by one or more oxygen or sulfur atoms; and

the physiologically acceptable salts thereof.

3,939,205

PROCESS FOR HYDRATING AN UNSATURATED NITRILE

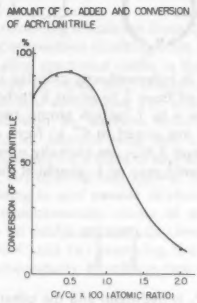
Tokuzo Kurata; Takeshi Okano; Kunihiko Ohfuchi, all of Kitakyushu; Akio Tamaru, Yokohama; Yoshifumi Murata, Kitakyushu, and Saburo Nagashima, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Nov. 17, 1972, Ser. No. 307,622

Claims priority, application Japan, Nov. 19, 1971, 46-092840; Apr. 24, 1972, 47-041172; Sept. 1, 1972, 47-087641

Int. Cl. C07c *103/08*

U.S. Cl. 260—561 N 15 Claims



1. A process for preparing an amide, which comprises hydrolyzing acrylonitrile or methacrylonitrile to the corresponding amide in the presence of a copper catalyst obtained by reducing copper oxide, copper hydroxide, a copper salt of an inorganic acid, a copper salt of an aliphatic acid or a copper salt of an aromatic acid with formaldehyde in the presence of an alkali in an aqueous medium.

3,939,206

PROCESS FOR PREPARATION OF TERPENE FLAVORANTS AND NOVEL INTERMEDIATES THEREFOR

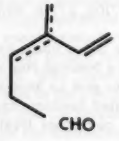
Erhard Bertele, Dubendorf, and Peter Schudel, Grut near Wetzikon, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 742,178, July 3, 1968, Pat. No. 3,872,172. This application Jan. 25, 1974, Ser. No. 436,756

Int. Cl.² C70C *47/20*

U.S. Cl. 260—601 R 2 Claims

1. A compound of the formula:



3,939,207

METHOD FOR PREPARING ALDEHYDES

Albert Eschenmoser, Bergstrasse 9, Kuesnacht, Zurich, Switzerland

Continuation-in-part of Ser. No. 856,478, Sept. 9, 1969, abandoned. This application Mar. 16, 1973, Ser. No. 341,829

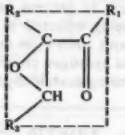
Claims priority, application Switzerland, Sept. 19, 1968, 14014/68

Int. Cl.² C07C *47/20*

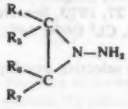
U.S. Cl. 260—601 R 13 Claims

1. Process for the manufacture of an aldehyde of the formula

in which either R_1 and R_3 together represent alkylene with 2 or 3 chain carbon atoms, or R_2 and R_3 together represent alkylene with 3 or 4 chain carbon atoms and the remaining R_2 or R_1 is hydrogen or lower alkyl, which comprises condensing a compound of the formula



wherein R_1, R_2 and R_3 have the above meanings, with the aminoaziridine of the formula



in which R_4, R_5, R_6 and R_7 each represents a member selected from hydrogen, lower alkyl, lower alkenyl, lower cycloalkyl, phenyl, tetrahydronaphthyl or phenyl substituted by at least one halogen, lower alkyl or phenyl, or R_5 and R_6 together are alkylene with 3 to 5 carbon atoms and R_4 and R_7 are hydrogen, at about room temperature and heating the condensation product to about 170° until the evolution of molecular nitrogen ceases.

3,939,208

PROCESS FOR PREPARING METHACROLEIN FROM ISOBUTENE AND OXYGEN

Enrico Cavaterra, Saronno; Donato Petrera, Arenzano; Francesco Pignataro, and Gabriele Colucci, both of Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed July 23, 1974, Ser. No. 491,062

Claims priority, application Italy, July 24, 1973, 26969/73

Int. Cl.² C07C *45/04*

U.S. Cl. 260—604 R 2 Claims

1. A process for obtaining methacrolein from isobutene by reaction thereof in a gaseous phase with oxygen or oxygen containing gaseous mixtures, at a temperature comprised between 350° and 500°C, characterized in that in said process there is used a catalytic system consisting of a chemical combination of the elements: tellurium, cerium, molybdenum, at least one element selected from the group consisting of Na, K, Li, Rb and Cs, and, in addition, of oxygen, the different elements being present in the catalytic system in atomic ratios

represented by the following formula: $Me_vTe_xCe_yMo_{12}O_z$, wherein Me is Na, K, Li, Rb, Cs or mixtures thereof, $v = 0.3 - 18$, $x = 0.3 - 24$, $y = 0.3 - 21$ and z corresponds to the quantity of oxygen bound to the other elements and corresponding to their state of oxidation in the catalyst.

3,939,209

ACETALDEHYDE PRODUCTION

Morgan C. Sze, Upper Montclair, and Ruey H. Wang, Parsippany, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Division of Ser. No. 183,788, Sept. 27, 1971, Pat. No. 3,869,518. This application Feb. 24, 1975, Ser. No. 552,534

Int. Cl.² C07C 45/04

U.S. Cl. 260—604 AC 16 Claims

1. A process for producing acetaldehyde and vinyl chloride, comprising:

contacting a molten mixture comprising a multivalent metal chloride in both its higher and lower valence state and the corresponding oxychloride in an amount sufficient to provide oxygen requirements for acetaldehyde production, said multivalent metal being selected from the group consisting of copper, chromium, cobalt, maganese and iron with a gaseous feed comprising a hydrocarbon selected from the group consisting of ethane, ethylene and mixtures thereof and further comprising ethyl chloride in an amount sufficient to prevent net production thereof, said contacting being effected at a temperature from about 700°F to about 1000°F, in the essential absence of added chlorine and hydrogen chloride to produce a gaseous effluent comprising acetaldehyde and vinyl chloride.

3,939,210

SELECTIVE OXYALKYLATION OF MERCAPTOPHENOLS

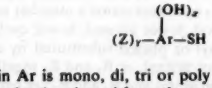
Francis J. Bajer, Depew, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Sept. 27, 1973, Ser. No. 401,316

Int. Cl.² C07C 149/36

U.S. Cl. 260—609 F 8 Claims

1. A process for the selective oxyalkylation of a mercaptophenol of the formula:



wherein Ar is mono, di, tri or poly atomic phenol; each Z is independently selected from the group consisting of hydrocarbon, halogen or hydrogen and the sum of X and Y is the total remaining substitutable positions of Ar, comprising reacting said mercaptophenol with a silylating agent containing the silyl grouping

wherein R is a monovalent hydrocarbon radical and n is from 0 to 3, oxyalkylating the mercapto function of the resulting silylated mercaptophenol to the degree of oxyalkylation desired and therefrom hydrolyzing the product.

3,939,211

CATALYTIC OXIDATION OF HYDROCARBONS

Richard Harvey Spector, S. Brunswick Township, and Richard Keith Madison, Murray Hill, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed July 11, 1974, Ser. No. 487,848

Int. Cl.² C07C 179/02

U.S. Cl. 260—610 B 10 Claims

1. A process for preparing beta-isopropylnaphthalene hydroperoxide which comprises intimately contracting, with agitation beta-isopropylnaphthalene dispersed in an alkaline, aqueous medium with molecular oxygen at a temperature of from about 75° to 100°C. in the presence of 25 to 1000 parts per million parts of beta-isoproplynaphthalene of a heavy metal catalyst selected from the group consisting of the nickel^{II} complex of α,α'-(ethylenedinitrilo)di-o-cresol, tris(triphenylphosphine)rhodium (I) chloride and bis(triphenylphosphine) iridium carbonylchloride.

3,939,212

CHLORINATED AND BROMINATED CARBOCYCLIC DIETHERS

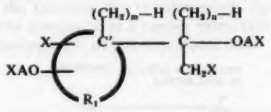
Corwin J. Bredeweg, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 4, 1972, Ser. No. 311,456

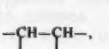
Int. Cl.² C07C 43/18, 43/28

U.S. Cl. 260—611 R 11 Claims

1. A compound represented by the formula



wherein each X is independently chlorine or bromine, A is a vicinal alkylene of from 2 to about 8 carbon atoms, R_1 is an alkylene of from 4 to 7 carbon atoms, two terminal carbon atoms of which are joined to C′ to form a carbocyclic ring upon which X- and XAO- are vicinally substituted and m and n are independently zero or 1, provided that when A has the formula



one of R_2 and R_3 is hydrogen and the other is hydrogen or an alkyl, monohydroxyalkyl, monochloroalkyl or monobromoalkyl group of from 1 to 6 carbon atoms.

3,939,213

PREPARATION OF POLYALKOXYALKYL COMPOUNDS

Edwin H. Homeier, Maywood, and Robert A. Dombro, Arlington Heights, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed May 20, 1974, Ser. No. 471,515

Int. Cl.² C07C 41/02, 41/06

U.S. Cl. 260—615 B 9 Claims

1. A process for the preparation of a polyalkoxylated alkane which comprises treating, at a temperature of about 100°C. to about 500°C. and a pressure of from 1 to about 100 atmospheres, an alkene having from 4 to 18 carbon atoms with ethylene oxide or propylene oxide in a hydrogen atmosphere in the presence of a catalyst selected from the group consisting of transition metal chlorides, hydroxides, acetates, and decacarbonyls and π-cyclopentadienyl derivatives of transition metal chlorides or oxides.

3,939,214

OXIDATION OF AROMATIC COMPOUNDS WITH A TETRAVALENT LEAD OXIDATION SYSTEM

Robert Allan Campbell Rennie, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 27, 1971, Ser. No. 147,607

Claims priority, application United Kingdom, June 8, 1970, 27540/70

Int. Cl.² C07C 37/00, 27/16, 49/82; C07D 215/14

U.S. Cl. 260—621 G 11 Claims

1. A process for the liquid phase oxidation of an aromatic compound containing a benzene ring with at least one unsubstituted carbon atom to give an aromatic compound containing a hydroxy substituted benzene ring or the corresponding ester, which process comprises treating an aromatic com-

pound selected from the group consisting of alkyl benzenes, diphenyl ether, diphenyl, naphthalene, anthracene, phenanthrene, quinoline and isoquinoline, with a homogeneous solution of a soluble salt of an alkali metal and a tetravalent lead compound dissolved in a strong liquid acid having a pKa less than about 1.5 at a concentration of 0.1 to 0.01 N at ambient temperature whereby said aromatic compound is oxidized to the corresponding hydroxy substituted compound or ester thereof, said strong acid comprising between 50 and 100% by volume of the solution and being selected from the group consisting of perchloric acid, fluoboric acid, trifluoroacetic acid, dichlorofluoroacetic acid and chlorodifluoroacetic acid.

3,939,215
CHEMICAL PROCESS

Lloyd E. Goddard, Orangeburg, S.C., assignor to Ethyl Corporation, Richmond, Va.

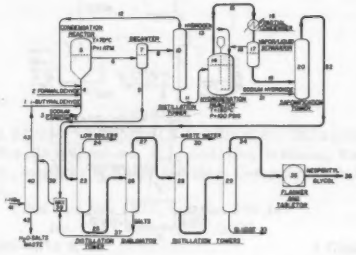
Filed May 22, 1974, Ser. No. 472,352
Int. Cl.² C07C *39/06, 37/22*
U.S. Cl. 260—624 A **5 Claims**

1. A method of removing aluminum from a sec-alkylphenol composition, said composition resulting from the alkylation of phenol with a sec-alkyl precursor olefin in the presence of an aluminum phenoxide catalyst, said composition containing aluminum, said method comprising (a) adding to said sec-alkylphenol composition an aqueous solution of an alkali metal hydroxide in an amount such that said alkali metal hydroxide is in stoichiometric excess of said aluminum to form a caustic mixture, (b) heating said caustic mixture at about 30°–150°C, (c) adding to said caustic mixture a mineral acid in an amount in stoichiometric excess of said alkali metal hydroxide to form an acidic mixture, (d) heating said acidic mixture at 30°–150°C and (e) removing the acidic aqueous phase leaving a substantially aluminum-free sec-alkylphenol composition.

3,939,216
PROCESS FOR THE PREPARATION OF NEOPENTYL GLYCOL

Roger L. Wright, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 26, 1974, Ser. No. 483,321
Int. Cl.² C07C *29/00*
U.S. Cl. 260—635 P **4 Claims**

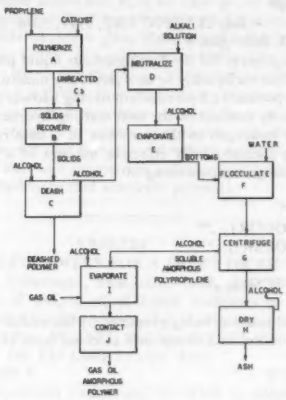


1. In a process for producing neopentyl glycol of high purity wherein isobutyraldehyde and formaldehyde are reacted in a condensation reactor in the presence of a condensation catalyst to form a reaction mixture containing hydroxypivaldehyde; said reaction mixture is separated into an organic component containing hydroxypivaldehyde and an aqueous component containing the spent catalyst; which hydroxypivaldehyde-containing component is then reduced to produce neopentyl glycol; saponified with caustic to cleave hydroxypivaldehyde esters present in the crude neopentyl glycol-containing reaction mixture; and the resulting mixture sublimated by passing steam through the saponified reaction mixture in a sublimator, the sublimator being at a temperature of about 70°C. to about 140°C.; the improvement which comprises mixing residue from the sublimator base with the aqueous spent catalyst-containing component from the condensation reactor to provide a liquid mixture, extracting the organic materials from the mixture with sufficient isobutyraldehyde to provide a minimum isobutyraldehyde to water ratio in the extractor of about 0.18 to 1.0, and utilizing the resultant isobutyraldehyde extract as a feed to the condensation reactor.

3,939,217
ALCOHOL PURIFICATION PROCESS

Herbert W. H. Meyer, Jr., Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 24, 1975, Ser. No. 552,654
Int. Cl.² C07C *29/24*
U.S. Cl. 260—643 D **13 Claims**



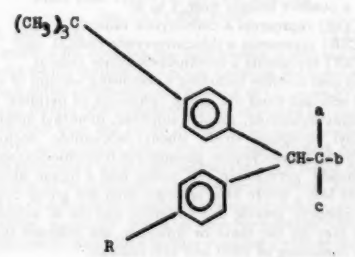
1. A process for the recovery of lower alkanol used to deash alpha-olefin polymer wherein the alkanol after deashing comprises a mixture of said alkanol, contaminates and amorphous alpha-olefin polymer which comprises adding a minor amount of water to said mixture to form a floc containing a substantial portion of said contaminates, centrifuging said mixture to remove the floc therefrom, and thereafter evaporating to recover alkanol.

3,939,218
P-TERT-BUTYL-DIPHENYLALKANE INSECTICIDES

Jerry G. Strong, Warren, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 23, 1974, Ser. No. 499,866
Int. Cl.² C07C *25/18*
U.S. Cl. 260—649 DD **4 Claims**

1. A compound having the following general structure:



wherein R is selected from the group consisting of CH_3 and C_2H_5, *a* is chloro, *b* is selected from the group consisting of CH_3 and C_2H_5 and *c* is hydrogen.

3,939,219

HYROGENATION OF UNSATURATED COMPOUNDS

Geoffrey Wilkinson, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

Continuation-in-part of Ser. No. 53,031, July 7, 1970, Pat. No. 3,725,305. This application Feb. 6, 1973, Ser. No. 330,106

Claims priority, application United Kingdom, July 14, 1969 35249/69

Int. Cl.[2] **C07C** *5/02, 5/04, 5/06, 5/08*

U.S. Cl. 260—666 P **22 Claims**

1. A process for the homogeneous liquid phase hydrogenation of an olefinically or acetylenically unsaturated hydrocarbon to produce a hydrocarbon having a lower degree of unsaturation by contact of the said starting hydrocarbon with molecular hydrogen in the presence of a catalyst solution containing a catalytically effective amount of a cation selected from the group consisting of:

M_2^{n+}
$M_2(OCOR)_{4-n}^{n+}$
$M_2(OCSR)_{4-n}^{n+}$
and
$M2(SCSR)_{4-n}^{n+}$

the said solution being prepared by the addition of strong acid to a solution of a compound selected from the group consisting of

$M_2(OCOR)_4$
$M_2(OCOR)_4L$
$M_2(OCOR)_4L_2$
$M_2(OCSR)_4$
$M_2(OCSR)_4L$
$M_2(OCSR)_4L_2$
$M_2(SCSR)_4$
$M_2(SCSR)_4L$
and
$M_2(SCSR)_4L_2$

where M is a metal selected from the group consisting of Mo, Cr, Cu, Re and metals of the platinum group;

R is selected from the group consisting of methyl and phenyl;

L is a ligand selected from the group consisting of H_2O, CH_3OH, C_2H_5OH, pyridine, Cl^- and Br^-;

n is a positive integer from 1 to 4;

(OCOR) represents a carboxylate radical;

(OCSR) represents a thiocarboxylate radical, and

(SCSR) represents a diethiocarboxylate radical,

and the said solution including a stabilising amount of a donor ligand selected from the group consisting of pyridine, quinoline, dimethylaniline, dibutyl sulphide, dimethyl sulphoxide, triphenyl phosphine oxide, phenyl isocyanide, acetonitrile, phosphorus tri-isocyanate, phosphorus triisothiocyanate, stannous halide, germanium (II) halide and a ligand having the formula MR'_3 where M is selected from the group consisting of phosphorus, arsenic and antimony and the R′ substituents, which may be the same or different, are selected from the group consisting of alkyl and aryl radicals.

3,939,220

DEHYDROGENATION METHOD AND MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

Richard E. Rausch, Mundelein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 304,177, Nov. 6, 1972, Pat. No. 3,790,473, which is a continuation-in-part of Ser. No. 142,079, May 10, 1971, Pat. No. 3,702,294, which is a continuation-in-part of Ser. No. 819,114, April 24, 1969, abandoned, and Ser. No. 807,910, March 17, 1969, Pat. No. 3,740,328. This application Jan. 18, 1974, Ser. No. 434,746

Int. Cl.[2] **C10G** *35/06;* **C07C** *3/28, 5/32;* **B01J** *23/62*

U.S. Cl. 260—668 D **17 Claims**

1. A catalytic composite comprising a combination of a platinum or palladium component, an iridium component, a rhenium component, a tin component and an alkali or alkaline earth component with a porous carrier material in an amount sufficient to result in a composite containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.01 to about 2 wt. % rhenium, about 0.01 to about 5 wt. % tin and about 0.01 to about 5 wt. % alkali metal or alkaline earth metal, wherein substantially all of the platinum or palladium component, iridium component, and the rhenium component are present in the corresponding elemental metallic states and wherein substantially all of the tin component is present in an oxidation state above that of the elemental metal.

9. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon with the catalytic composite defined by claim 1 at dehydrogenation conditions.

3,939,221

XYLENES SEPARATION PROCESS

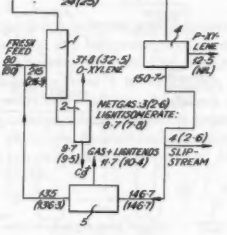
David Pearce, Virginia Water, England, assignor to The British Petroleum Chemical International Ltd., London, England

Filed July 23, 1974, Ser. No. 490,936

Claims priority, application United Kingdom, July 27, 1973, 35842/73

Int. Cl.[2] **C07C** *7/13*

U.S. Cl. 260—674 SA **11 Claims**



1. In a continuous process for the separation of a feedstock containing a major proportion of mixed xylene isomers into substantially pure o- and p-isomer fractions by feeding the feedstock to a fractional distillation column in which a fraction containing a major portion of the o-xylene in the feedstock is removed from the bottom of the column and further fractionated to recover substantially pure o-xylene and a major portion of the p-xylene in the feedstock is removed in an overhead fraction, the p-xylene being removed from the overhead fraction by crystallization and the mother liquor therefrom being recycled to the feed after contact with an isomerization catalyst, the improvement which comprises, prior to contacting said mother liquor remaining after crystal-

lization with an isomerization catalyst, the steps of combining said mother liquor with additional mother liquor and contacting said combined mother liquor with a crystalline alumino-silicate active for the selective adsorption of p-xylene the hydrated form of which has the formula:

$$M_{2/n}O : Al_2O_3 : wSiO_2 : yH_2O \quad (I)$$

wherein M is a cation which balances the electrovalance of the tetrahedra, n represents the valence of the cation, w represents the number of moles of SiO_2 and y represents the number of moles of water;

and, thereafter recovering the adsorbed p-xylene from said substrate, the amount of said mother liquor added being substantially equal to the quantity of p-xylene recovered from said crystalline alumino-silicate in any given time.

3,939,222

PRODUCTION OF POLYURETHANE PLASTICS

Dieter Dieterich, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 299,513, Oct. 20, 1972, abandoned. This application Apr. 26, 1974, Ser. No. 464,600

Claims priority, application Germany, Oct. 26, 1971, 2153269

Int. Cl.² C08L *75/04*

U.S. Cl. 260—858 **2 Claims**

1. A storage stable dispersion of solid polyurethane or polyurea particles (a) in a liquid prepolymer (b) (liquid or pasty) suitable for the production of polyurethane plastics substantially without the use of added solvents where the dispersion comprises two components

a. 30–80 wt. % solid thermoplastic polyurethane or polyurea particles having particle sizes between 0.5–300μ and a ring and ball softening point below about 200°C. which are insoluble in component b) at temperatures below at least 30°C. and which are soluble in component b) at temperatures above about 80°C. as noncoherent disperse phase and

b. 20–70 wt. % of a liquid polyurethane prepolymer as coherent phase.

3,939,223

BARRIER RESINS AND IMPACT MODIFIERS THEREFOR

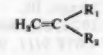
John A. Powell, Willingboro, N.J., and Alan Williams, Richboro, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 27, 1972, Ser. No. 248,147

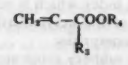
Int. Cl.² C08L *51/00, 53/00*

U.S. Cl. 260—876 R **3 Claims**

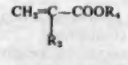
1. An impact-modified barrier resin composition having a superior balance of properties comprising a blend of (A) from about 60 to 80 weight percent of a polymer of from about 50 to 90 weight percent acrylonitrile, from about 5 to 28 weight percent of a vinylidene aromatic monomer of the formula



wherein R_1 is hydrogen, chlorine or methyl and R_2 is a substituted or unsubstituted aromatic radical having from 6 to 10 carbon atoms and from about 2 to about 25 weight percent of an olefinic ester monomer of the formula



wherein R_3 is hydrogen, an alkyl group having from 1 to 4 carbon atoms or a halogen, and R_4 is an alkyl group of from 1 to 8 carbon atoms, and (B) from about 20 to 40 weight percent of a graft copolymer of (1) from 20 to 60 weight percent of a superstrate polymer polymerized from a monomer mixture comprising from 50 to 90 weight percent acrylonitrile, from 5 to 28 weight percent of vinylidene aromatic monomer and from 2 to 25 weight percent of olefinic ester of the formula



wherein R_3 is hydrogen, halogen, or an alkyl group having from 1 to 4 carbon atoms and R_4 is an alkyl group of from 1 to 6 carbon atoms and (2) from 80 to 40 weight percent of a substrate polymer having a glass transition termperature of temperature than −40°C. comprising 50 to 100 weight percent of a conjugated diene selected from the group consisting of 1,3-butadiene and isoprene, from 50 to 0 weight percent of an ethylenically unsaturated monomer selected from the group consisting of vinylidene aromatic compounds, acrylonitrile, and mixtures thereof, and from 0 to 10 weight percent olefinic ester, provided that said superstrate polymer is at least about 50 percent grafted onto said substrate polymer.

3,939,224

BLOCK COPOLYMERS FOR A SHEET OR FILM

Shigeki Horiie, Yokohama; Shin-Ichiro Asai, and Yoshihisa Moriya, both of Tokyo, all of Japan, assignors to Kenki Kagaku Kogyo Kasushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1973, Ser. No. 423,617

Int. Cl.² C08F *236/00, 4/46*

U.S. Cl. 260—880 B **5 Claims**

1. A block copolymer comprising 70 – 85% by weight of a styrene-type unit and 15 – 30% by weight of a conjugated diene unit prepared from a mixture of styrene-type monomers and conjugated diene monomers in a non-polar organic solvent with use of a poly-functional organolithium compound as an initiator, said mixture containing 30 – 70% by weight of said styrene-type monomers, wherein a first polymerization is effected, after which additional styrene-type monomers are added in such amount that the content of styrene units accounts for the proportion of 70 to 80% by weight of the finally obtained block copolymer when 40% or more of the diene monomers added have been converted to a copolymer, and effecting a polymerization to completion.

3,939,225

LENSES FOR EXTERIOR VEHICLE LAMPS

William J. Hall, Brimfield, and Robert A. Myers, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 19, 1973, Ser. No. 426,380

Int. Cl.² C08L *9/06*

U.S. Cl. 260—880 R **12 Claims**

1. A method for covering the light source in exterior lamps in vehicles which method comprises covering the lamp with a lens which is the polymerization product of (1) from 55 to 85 percent by weight of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile and mixtures of acrylonitrile and methacrylonitrile which contain up to 20 percent by weight of methacrylonitrile based on the total weight of acrylonitrile and methacrylonitrile; and (2) from 15 to 45 percent by weight of a monovinylidene aromatic hydrocarbon monomer which is copolymerizable with the nitrile monomer; and which further contains a rubber compo-

nent having a refractive index which is substantially the same as the refractive index of the acrylonitrile polymer, wherein the rubber component comprises:

A. A butadiene-styrene rubbery substrate having a butadiene content of 68 to 72 percent by weight and a styrene content of 28 to 32 percent by weight based on the total weight of the butadiene-styrene rubbery substrate which rubbery substrate is further characterized as having a refractive index in the range of from 1.5375 to 1.5475, a particle size in the range of from 0.06 to 0.2 micron, a gel content in the range of from 40 to 95 percent, a swelling index in the range of from 10 to 40, and a second order transition temperature (Tg) less than −40°C.; and

B. a superstrate grafted onto the rubbery substrate which superstrate comprises:

1. the polymerization product of a first polymerizable monomer composition comprising:
   a. from 0.1 to 2 percent by weight of a nonconjugated diolefin monomer;
   b. from 0 to 30 percent by weight of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile, and mixtures of acrylonitrile and methacrylonitrile which contain up to 20 percent by weight of methacrylonitrile;
   c. from 40 to 60 percent by weight of a vinylidene aromatic hydrocarbon monomer; and
   d. from 20 to 50 percent by weight of an alkyl ester of acrylic or methacrylic acid wherein the alkyl group contains from 1 to 8 carbon atoms, wherein the percent by weight is based on the total weight of the monomer in the first polymerizable monomer mixture; and
2. a second polymerizable monomer composition comprising from 55 to 85 percent by weight of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile and mixtures of acrylonitrile and methacrylonitrile which contains up to 20 percent by weight of methacrylonitrile based on the total weight of acrylonitrile and methacrylonitrile and from 15 to 45 percent by weight of a monovinylidene aromatic hydrocarbon monomer wherein the percent by weight is based on the total weight of the monomers in the second polymerizable monomer mixture;

wherein the grafted superstrate contains a total of at least 40 percent by weight ethylenically unsaturated nitrile monomer and wherein the ratio of grafted superstrate to substrate is in the range of from 15–200:100, wherein the amount of rubber in the polymerization product calculated on the weight of the rubber prior to grafting, is in the range of from 10 to 30 percent by weight.

3,939,226

PHOSPHONOMETHYL COMPOUNDS

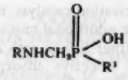
Daniel J. Scharf, Cheektowaga, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,195

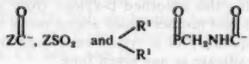
Int. Cl.² C07F 9/141

U.S. Cl. 260—932 **31 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of ^+OH, alkoxy of 1–6 carbon atoms and aryloxy and R is selected from the group consisting of



wherein Z is ^+OH, alkyl from 1–6 carbon atoms aryl, alkoxy from 1–6 carbon atoms and aryloxy, provided that at least one R^1 is selected from the group consisting of alkoxy of 1–6 carbon atoms or aryloxy.

3,939,227

BIS(HYDROXY AND HALO ALKYL) ALKYL OR ARYL PHOSPHONATES

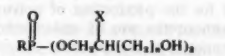
Siegfried Altscher, Monsey, and Jagadish C. Goswami, New City, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed July 29, 1974, Ser. No. 492,562

Int. Cl.² C07F 9/40; C08J 9/00

U.S. Cl. 260—953 **6 Claims**

1. Compounds of the formula



where *n* is an integer from 1 to 8, R is selected from the group consisting of C_1-C_{30} alkyl, phenyl and halo- substituted C_1-C_{20} alkyl and phenyl and X is halogen.

3,939,228

PROCESS FOR PRODUCING PHOSPHAZENE COMPOUND

James T. F. Kao, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 4, 1973, Ser. No. 347,833

Int. Cl.² C07F 9/15

U.S. Cl. 260—973 **8 Claims**

1. A process for the manufacture of phosphazene compounds consisting essentially of reacting alkali metal alkoxide having from 1 to about 6 carbon atoms or alkali metal phenoxide with a phosphonitrilic halide at from about 70° to about 150°C in a reaction medium consisting essentially of a liquid paraffinic hydrocarbon and an inert chloroaromatic hydrocarbon solvent.

3,939,229

PREPARATION OF ALIPHATIC PHOSPHATES

Ingenuin Hechenbleikner, West Cornwall, and William Plamer Enlow, Falls Village, both of Conn., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 4, 1974, Ser. No. 529,672

Int. Cl.² C07F 9/11, 9/113

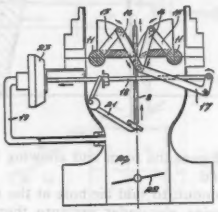
U.S. Cl. 260—985 **7 Claims**

1. A process for preparing aliphatic phosphates comprising contacting a trialkyl or trialkenyl phosphite with oxygen in the presence of a metal catalyst selected from the class consisting of chromium, copper, tin or cobalt catalysts, at a temperature of from about 20°C to about 60°C.

3,939,230
CARBURETORS

Arpad Simon, Nova Iquacu City, Brazil, assignor to Atom Auto Pecas Ltd., Nova Iquacu City, Brazil

Filed Dec. 7, 1971, Ser. No. 205,611
Claims priority, application Brazil, Jan. 18, 1971, 320
Int. Cl.² F02M 9/08
U.S. Cl. 261—50 A 1 Claim



1. In carburators for internal combustion engines comprising two articulate venturi blocks which in combination produce between them a variable aperture, said blocks being mounted in the intake path of the carburator and being combined with a diaphragm control device which actuates a feeding needle valve located inside a feed nozzle connected with a constant level float chamber providing fuel, the improvement

wherein said two variable aperture venturi blocks are similarly shaped and are pivotally mounted on two spaced parallel pivoting axes so as to swing inwardly and downwardly and vice-versa, describing an arc of approximately 90 degrees, said venturi blocks being so shaped that a small aperture is formed between them when in their elevated position, said aperture widening as the blocks swing inwards and downwards on account of the particular configuration given to said blocks, said aperture being located directly above said feed nozzle;

wherein said feed nozzle stands vertically and the wall of the lower end of said feeding nozzle tapers downwards and displays around its tapered periphery a plurality of spraying outlets, the bore of said feed nozzle above said tapering lower end being substantially cylindrical, but tapering internally into a narrow passage and tapering out again, thus forming two small chambers, one above and one below said narrow passage, said lower chamber being located immediately above the final lowermost tapering, wherein said plurality of spraying outlets is located; and

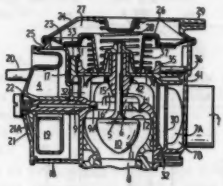
wherein said feeding needle valve includes a downwardly tapered feeding needle freely mounted in said feed nozzle and a generally cylindrical seat internally mounted in threaded relationship — allowing vertical shifting — on the lower tapered end of said feed nozzle, said feeding needle being capable of abutting the upper end of said cylindrical seat.

3,939,231
CARBURETTORS AND ASSOCIATED COMPONENTS

William Henry Steele, Bonnet Bay, and George Nejtek, Condell Park, both of Australia, assignors to Victa Limited, Milperra, Australia

Filed Sept. 19, 1973, Ser. No. 398,800
Claims priority, application Australia, Sept. 20, 1972, 507/72
Int. Cl.² F02M 1/02, 9/12
U.S. Cl. 261—62 13 Claims

1. A carburettor for deriving a fuel/air mixture for application to a gas engine subject to changing loads, comprising a housing, individual inlet means to said housing for fuel and air, a fuel/air mixing chamber in said housing connected to an outlet, a valve seat in said housing and in the path of fuel and air passing from said inlet means to said chamber, an axially displaceable valve co-operating with said valve seat to control the flow of fuel and air to said chamber, a second chamber in said housing, an element movable within said second chamber and dividing said second chamber into two compartments and connected to said valve to open and close said valve, a manually operable throttle control for said engine including a rotatable throttle control member within said housing and coaxial with said valve and connected with said movable element to change the position thereof within said second chamber to determine the open condition of said valve with respect to said valve seat, said open condition corresponding to a selected

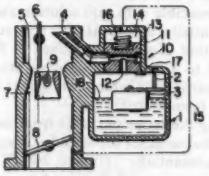


speed of said engine, resilient means for biasing said movable element to said changed position, and an automatic speed governor control for said engine including means for fluid connection with a first one of said compartments for communicating thereto fluid pressure changes indicative of changes in speed of said engine, said fluid pressure changes effecting movement of said movable element with respect to its said changed position to increase said open condition of said valve with decreasing speed of said engine and to decrease said open condition of said valve with increasing speed of said engine, thereby maintaining substantially uniform speed of said engine corresponding to said selected speed.

3,939,232
CARBURETOR

Keizo Higashigawa, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed June 20, 1974, Ser. No. 481,324
Claims priority, application Japan, Dec. 10, 1973, 48-136832
Int. Cl.² F02M 5/02
U.S. Cl. 261—72 R 10 Claims

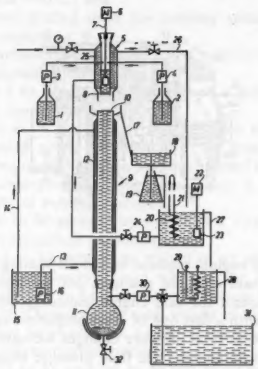


1. In a carburetor having an air horn, a choke valve, a venturi, a throttling valve, a discharge nozzle, a float chamber, and an air vent in communication with said float chamber, the improvement comprising valve means located between said float chamber and said air vent for closing said air vent under the pressure of fuel within said chamber when a vehicle is excessively inclined or upset, said valve means comprises a valve box and a piston-shaped valve movable within said valve box, said valve means including an upper chamber formed between said piston-shaped valve and said valve box, and a negative pressure transmission line having one end connected to said upper chamber and the other end connected to the intake manifold of the carburetor.

3,939,233
METHOD FOR THE PRODUCTION OF SPHERICAL PARTICLES

Hubert Bildstein, Vienna; Karl Knotik, Siegendorf, and Peter Leichter, Vienna, all of Austria, assignors to HOBEG Hochtemperaturreaktor-Brennelement GmbH, Grossauheim, Germany

Filed Nov. 17, 1972, Ser. No. 307,561
Claims priority, application Austria, Nov. 18, 1971, 9980/71
Int. Cl. B01j *2/06*
U.S. Cl. 264—13 **4 Claims**



1. A method of producing spherical solid particles comprising the steps of:

a. suspending solid grains of at least one powdered substance selected from the group which consists of graphite, soot, boron oxide, amorphous boron, boron carbide, amorphous silicon, silicon oxide and silicon carbide in an aqueous solution of at least two mutually condensable organic compounds capable of forming upon curing at an elevated temperature a synthetic resin, one of said compounds being selected from the group which consists of resorcinol and urea, the other of said compounds being an aldehyde condensable with said one of said compounds;

b. forming droplets of the suspension of said grains of said powdered substance in said solution;

c. passing said droplets downwardly through a column of a liquid immiscible with said solution and at a temperature of substantially 80° to 100°C and sufficient to induce condensation of said compounds to form said synthetic resin and to cure the resulting synthetic resin, thereby forming particles in which said grains are distributed in a synthetic resin matrix;

d. separating the latter particles from said liquid; and

e. heating the particles separated in step (d) to a temperature of substantially 1800° to 2600°C to carbonize said synthetic resin and form graphite and carbides in the heated particles from the carbon formed on carbonization of said synthetic resin.

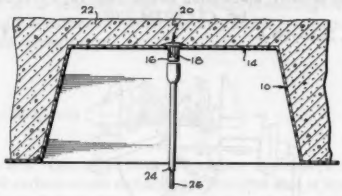
3,939,234
METHOD FOR SEALING AND STRIPPING A CONCRETE FORM

Stephen S. Dashew, Los Angeles, Calif., assignor to Interform Inc., Compton, Calif.

Filed Aug. 14, 1972, Ser. No. 280,348
Int. Cl.² B28B *21/90*
U.S. Cl. 264—31 **1 Claim**

1. A method for sealing and stripping a form of a type which has an air hole extending through a wall of the form comprising:

inserting through the air hole in an interference fit with the walls thereof, the shaft of a cap which has a thin dome with a concave inner surface at one end of the shaft, and depressing the center of the dome towards the form wall to deform the dome so it has a central dimple;



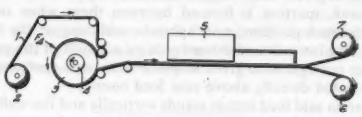
pouring concrete over the form and allowing it to at least partially set; and

applying a gas conduit to said air hole at the inside of the form and blowing gas under pressure therethrough to provide a layer of pressured gas between the concrete and form wall to loosen the form.

3,939,235
PROCESS FOR CONTINUOUS PRODUCTION OF THIN POLYURETHANE FOAM LAYERS

Willy F. Poppe, Sint-Niklaas, Belgium, assignor to Serpo, Sint-Niklaas, Belgium

Filed Mar. 19, 1974, Ser. No. 452,537
Claims priority, application Belgium, Mar. 30, 1973, 797553
Int. Cl.² B29D *27/04*
U.S. Cl. 264—46.6 **4 Claims**



1. Process for the continuous production of polyurethane foam layers comprising the steps of:

a. moving a band-like supporting layer longitudinally;

b. guiding said moving supporting layer at a particular location so as to form a section having a substantially cylindrical shape, the axis of said cylindrically shaped section being horizontal and being perpendicular to the direction of travel of said supporting layer;

c. rotating a disk within said cylindrically shaped section of said moving supporting layer; and simultaneously

d. projecting a foamable polyurethane reaction mixture on said moving supporting layer of said cylindrically shaped section; and simultaneously

e. reciprocally moving said rotating disk first in one direction and then in the opposite direction along said axis.

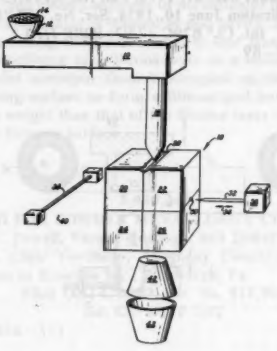
3,939,236
METHOD FOR BLOW MOLDING FOAMED WALLED PLASTIC OPEN MOUTHED CONTAINERS

Granville J. Hahn, Dallas, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Continuation-in-part of Ser. No. 81,488, Oct. 16, 1970, abandoned. This application Jan. 24, 1973, Ser. No. 326,568
Int. Cl.² B29C *17/07, 17/14;* **B29D** *27/00*
U.S. Cl. 264—53 **4 Claims**

1. A method for blow molding foamed walled plastic open-mouthed containers which comprises extruding foamed plastic through an annular orifice to form a foamed parison of tubular configuration, having foamed walls pinching a lower section of the tubular configuration within a lower portion of

a sectional mold, pinching an upper portion of the tubular configuration within an upper portion of a sectional mold, introducing a gas through a hollow needle inserted at a point through a center portion of said mold and parison therein and blowing the tubular configuration with a gas introduced through said needle at said point to form a hollow foam-walled body assuming the contour of the closed mold and severing

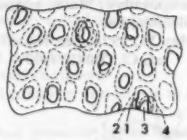


the molded hollow article in a single thin cut with a hot severing means passed through the center thereof, including the aperture formed in blowing, into two foamed wall container portions, said severing means melting said plastic as it passes thereby severing said container into clean smooth cut halves and substantially removing the aperture formed by said needle without substantial removal or production of plastic inter-connecting substances as scrap material.

3,939,237
METHOD OF MAKING A FLUID TRANSMITTING POROUS TUBE OR SHEET

Hirokuni Naito, Hino; Isao Yoshimura, Fujisawa, and Hisao Tashiro, Kawasaki, all of Japan, assignors to Asahi Dow, Ltd., Tokyo, Japan

Division of Ser. No. 190,548, Nov. 19, 1971. This application Apr. 22, 1974, Ser. No. 462,592
Int. Cl.² B29D *27/00*, *23/04*
U.S. Cl. 264—54 **8 Claims**



1. A method of making a tube or sheet-shaped fluid transmitting porous material having an extension of 1.2 to 10 times and a thickness of 0.15 to 3 mm. which comprises mixing a polyolefin (A) and a secondary polymer (B) and a decomposition type chemical blowing agent, said secondary polymer (B) being a member selected from the group consisting of:

1. an ethylene-vinyl ester copolymer of which the vinyl ester content is at least 10% or more by weight based on the copolymer,
2. a copolymer of ethylene with an unsaturated carboxylic acid ester of which the unsaturated carboxylic acid ester content is at least 10% or more by weight based on the copolymer,
3. a rubber selected from the group consisting of a natural rubber, a butadiene rubber, a solution-polymerized random copolymer type styrene-butadiene rubber, an emulsion-polymerized random copolymer type styrene-butadiene rubber, a butadiene-acrylonitrile rubber, an iosprene-butadiene rubber, a polyisoprene rubber and an isobutylene-isoprene rubber,
4. A thermoplastic elastomer selected from the group consisting of a styrene-butadiene block copolymer and a styrene-isoprene block copolymer, and mixtures thereof, said secondary polymer being employed in an amount of

$$5 \leqq \frac{B \times 100}{A + B} \leqq 95\% \text{ by weight;}$$

and continuously subjecting the resulting polymer mixture to extrusion while foaming, to form a film by passage through a die of an extruder; said extrusion moulding being effected under conditions defined by the formula:

$0.15 < S/t_2 10$

wherein

$t_2 = t_1/a^{1/6}$

$1.2 < a < 10$,

S represents an average die slit clearance (mm.),

t_2 represents an average thickness of the foaming polymer composition in the state before foaming (mm.),

t_1 represents an average thickness of the porous material (mm.), and

(a)represents an expansion based on the volume of the foaming polymer composition in the state before foaming (times.)

Said extrusion further satisfies the following conditions:

$7 \leqq V \leqq Q/W$

wherein

Q represents an extrusion volume of the extruded porous material from which the contained space volume is subtracted (cm^3/min.),

W represents a cross section area of the die slit (cm^2), and

V represents an extrusion speed calculated from Q and W (cm./min.).

3,939,238
METHOD FOR MANUFACTURE OF FACING BRICKS WITH SHARPLY DELINEATED PORTIONS OF DIFFERENT COLOR AND TEXTURE

Thomas R. Salts, Amarillo, Tex., assignor to Crowe-Gulde, Inc., Amarillo, Tex.

Division of Ser. No. 265,548, June 23, 1970, Pat. No. 3,799,716. This application Dec. 28, 1973, Ser. No. 429,085
Int. Cl.² B28B *1/08*
U.S. Cl. 264—71 **7 Claims**

1. A process for repeatedly and concurrently making a plurality of colored and coated concrete bricks of differing surface texture and color which process comprises the cycle of steps of

a. filling each of plurality of verically extending chambers in a mold with concrete mix, vibrating the mold and compacting the concrete mix in each of said chambers to form a plurality of plastic concrete brick masses, and spraying the mold surfaces of each chamber with a first fluid liquid slurry comprising cement and a first pigment prior to each filling of each said chamber of said mold with said concrete mix and thereby distributing said liquid slurry

over surfaces of each of said plastic concrete brick masses adjacent said mold and thereby coloring each of said plastic brick masses prior to removal of each of such plastic masses from said mold; then

b. removing thus-coated brick masses from the mold to thereby provide and thereafter maintaining a longitudinally and transversely extending array of a plurality of vertically extending spaced apart brick masses of predetermined width, depth, and height having between the separate brick masses in said array vertically and longitudinally extending spaces and vertically and transversely extending spaces, said spaced being narrow relative to said width, depth, and height of said brick masses said array of brick masses having between longitudinally neighboring masses of said array longitudinally and horizontally spaced apart parallel transversely and vertically extending surfaces and between transversely neighboring brick masses horizontally and transversely spaced apart parallel longitudinally and vertically extending surfaces, said vertically extending and relatively narrow spaces located between said vertically extending surfaces;

c.

i. preparing a viscous pigmented cementitious slurry thickened to be selectively adherent to a hydrophyllic wet surface,

ii. then periodically pressurising and atomizing said viscous pigmented cementitious thickened slurry and forming, at a spray source, a stream of small globules of atomized slurry and, while said brick masses are in a fixed spatial relation to said spray source, directing the said stream of small globules of atomized slurry towards and between and against

aa. a pair of inwardly sloped guide surfaces, said pair of guide surfaces having a wide opening at its top and a narrow opening at its bottom, said lower opening located above and parallel to the upper edges of a pair of said vertically extending spaced apart surfaces of neighboring brick masses in said array of plurality of spaced apart plastic concrete brick masses, each of said sloped guide surfaces having a slurry repellent surface and located above said vertically extending mass, and said guide surfaces of each said pair of guide surfaces having a common line of intersection below the top surface of said array of spaced apart vertically extending brick masses and within the vertically extending space located between said pair of vertically extending surfaces, and wherein a flat planar extrapolation of each of said surfaces of said pair of guide surfaces extends above the said upper edge of said vertically extending spaced apart surfaces of neighboring brick masses and

bb. into said vertically extending and relatively narrow spaces between said spaced apart vertically extending surfaces of neighboring brick masses in said array of a plurality of plastic concrete brick masses below said guide surfaces, and developing a turbulent flow of said stream of small globules at the top of the said vertically extending spaces and thereby then

iii. applying said small globules of atomized slurry selectively to a portion of a vertically extending surface of each of said plastic concrete brick masses in said array in an amount sufficiently thin to be static on said surface of said plastic concrete brick mass and sufficiently thick to provide an optically opaque layer, said portion of said vertically extending surface of each of said plastic concrete brick masses for each of such masses extending from an upper edge of said mass, said upper edge joining two corners of said mass and the contiguous area of a vertically extending surface thereof adjacent to said upper edge to a lower lobular edge, said lower lobular edge spaced away from the bottom edge of said brick, and providing a sharp delineation between each said optically opaque layer and the area of said plastic concrete brick mass surface therebelow

3,939,239

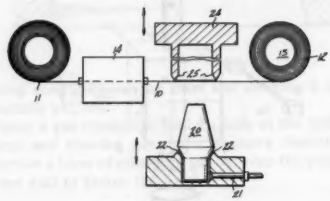
METHOD OF MAKING LINED ARTICLES

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation-in-part of Ser. No. 343,498, March 21, 1973, abandoned, which is a division of Ser. No. 186,984, Oct. 6, 1971, Pat. No. 3,787,157, which is a continuation-in-part of Ser. Nos. 71,734, Sept. 14, 1970, Pat. No. 3,717,544, and Ser. No. 100,050, Dec. 21, 1970, Pat. No. 3,719,735. This application June 10, 1974, Ser. No. 477,751

Int. Cl.[2] B29C *17/07*; B29F *1/10*

U.S. Cl. 264—89 **7 Claims**



1. A method of making lined, hollow plastic articles wherein a parison is formed on a core in a parison mold by molding plastic around a pre-formed plastic liner on the core in a parison mold cavity and wherein the parison is subsequently expanded in a blow mold, the improvement which comprises providing a supply of a web of plastic liner material, providing a holding means including a cutting means adjacent said web, bringing said web into juxtaposition with said core and holding means, forming said liner directly on said core by moving said core relative to the web and holding means to engage the web by the core and holding means and form the liner on the core by the core and holding means, said moving also severing the formed liner from the web by the cutting means, transferring the core with the formed, severed liner thereon for subsequent operations, and feeding the balance of the web for scrap reclamation.

3,939,240

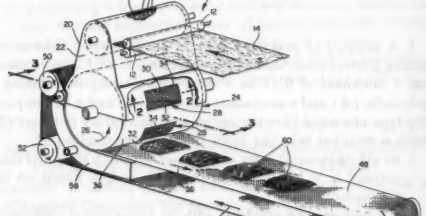
METHOD FOR FORMING FIBROUS PADS

Peter P. Savich, Longmeadow, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Filed May 16, 1974, Ser. No. 470,548

Int. Cl.[2] D04H *1/00*

U.S. Cl. 264—91 **2 Claims**



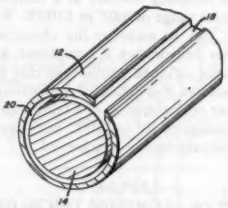
1. A method for forming a fibrous pad by employing a forming member including a cavity having a foraminous forming surface and upper margins defining an opening into said cavity, the area of the foraminous forming surface being greater than the area of the opening bound by the upper margins of said cavity, said method comprising the steps of:

A. forming a gaseous suspension of fibers;
B. establishing a pressure drop across the foraminous forming surface of the cavity to direct the gas of the suspension through the forming surface, and to condense the fibers of the suspension onto the forming surface in the form of a fibrous layer incompletely filling said cavity;
C. directing a transfer conveyor into overlying relationship with, and closely adjacent to the orfice of the cavity after the fibrous layer is formed in said cavity; and
D. transferring the fibrous layer to said transfer conveyor and confining said fibrous layer to a lesser area on the transfer conveyor than it occupied on the foraminous forming surface to form a fibrous pad having a greater basis weight than that of the fibrous layer on the foraminous forming surface.

3,939,241
METHOD FOR POWDER METALLURGY COMPACTING

Joseph W. Powell, Verona Borough, and James N. Fleck, Upper St. Clair Township, Allegheny County, both of Pa., assignors to Crucible Inc., Pittsburgh, Pa.

Filed Oct. 4, 1974, Ser. No. 511,963
Int. Cl.² B22F *3/02*
U.S. Cl. 264—111 **2 Claims**



1. In a method for isostatically compacting powder metallurgy charges by the application of fluid pressure by:
a. filling a generally cylindrical metal container with a powder metallurgy charge,
b. sealing said container,
c. outgassing said container,
d. heating said container and charge to an elevated temperature,
e. applying fluid pressure to the exterior of said heated container to isostatically compact said charge therein to produce a powder metallurgy compact,
f. releasing said pressure and cooling said container and compact, and
g. removing said compact from said container;
the improvement comprising:
h. applying to the interior surface of said container, prior to filling said container with said powder metallurgy charge, a separating medium layer for preventing bonding between said container and compact during application of said fluid pressure,
said container being steel and having a wall thickness of at least one-sixteenth inch, said container collapsing under said applied fluid pressure and establishing residual stresses within said container following the release of said fluid pressure, and
i. slitting said container to release said residual stresses, wherein said residual stresses within said container are sufficient to cause said container to spring open and move away from said formed compact therein.

3,939,242
FABRICATION PROCESS FOR MULTIPHASED PLASTICS

Robert D. Lundberg, Somerville, and Henry S. Makowski, Scotch Plains, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

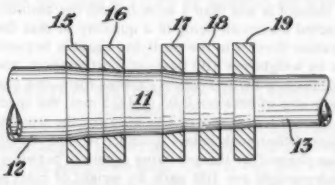
Division of Ser. No. 331,628, Feb. 12, 1973, Pat. No. 3,842,154. This application June 28, 1974, Ser. No. 483,977
Int. Cl.² B29B *3/00*
U.S. Cl. 264—294 **6 Claims**

1. A process for fabricating an article from a thermoplastic composition, said composition being a thermoplastic ionomer, i.e., a polymer having a thermoplastic backbone having polar groups selected from the group consisting of carboxylate, sulfonate, and phosphonate groups pendent thereto, said polar groups being present in from at least about 0.2 to about 15 mole % of the total polymer and capable of forming ionic domains, which comprises:
a. adding from about 0.1 to 50 moles per mole of polar group of a volatile preferential plasticizer to said ionomer, said plasticizer being dispersible in said ionomer, liquid during the processing of said ionomer, having a boiling point substantially above the softening point of the thermoplastic backbone and possessing at least one functional constituent exhibiting a bond moment whose absolute value is at least 0.6 debyes;
b. heating said ionomer to a temperature between the softening point of the thermoplastic backbone and the boiling point of the plasticizer;
c. forming said ionomer in a first desired shape at the temperature specified in step (b);
d. evolving said volatile plasticizer;
e. re-forming the product of step (d) in a second desired shape; at a temperature above the softening point of the thermoplastic backbone but below the ultimate softening point; and
f. cooling below the softening point of the thermoplastic backbone.

3,939,243
TUBE TREATING AND METHOD

David H. Dawson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 19, 1974, Ser. No. 498,680
Int. Cl.² B29D *23/01*
U.S. Cl. 264—296 **5 Claims**



1. A method for the preparation of a synthetic resinous tube capable of radial expansion and generally without change of length of the tube upon expansion, the steps of the method comprising
providing a synthetic resinous thermoplastic tube having a diameter greater than a desired diameter,
introducing a portion of the tube into a plurality of die plates having successively smaller circular openings therein, the tube having a region of decreased diameter generally adjacent the die plate having the smaller opening and a region of major diameter generally adjacent the die plate having the largest port opening,
moving at least one of the die plates towards the region of major diameter thereby reducing the diameter of a por-

tion of the tube while maintaining the conduit in fixed relation to at least a major portion of the remaining die plates, subsequently, in sequence,

moving each said plurality of die plates in hereinbefore described manner to provide a synthetic resinous thermoplastic tube having reduced diameter, the foregoing steps being performed at a temperature between the glass temperature of the resinous tube and the softening temperature.

3,939,244
PROCESS FOR THE PURIFICATION OF TITANIUM TETRACHLORIDE

Luigi Piccolo; Antonio Paolinelli, both of Milan, and Marcello Ghirga, Bresso (Milan), Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Nov. 27, 1972, Ser. No. 309,828

Claims priority, application Italy, Dec. 27, 1971, 32955/71; May 3, 1972, 23849/72

Int. Cl.² C01G 23/02

U.S. Cl. 423—76 **14 Claims**

1. Process for the purification of titanium tetrachloride in gaseous or liquid form, obtained by chlorination of rutile or ilmenitic ores or ilmenitic slag or other materials containing titanium dioxide in the presence of carbon at elevated temperatures to remove organic impurities so that the titanium tetrachloride product is colorless and to remove vanadium compounds so that the residual content of vanadium metal is less than 5 p.p.m., characterized in that said titanium tetrachloride is brought into contact with a purifying agent consisting of a support selected from alumina or sodium chloride when said titanium tetrachloride is purified in liquid form and a support of alumina when said titanium tetrachloride is purified in gaseous form, said support being in granular form which is inert to metallic sodium and titanium tetrachloride with which metallic sodium has been contacted by bringing the sodium to its melting point in a closed vessel containing the granular inert support material under agitation for at least 15 minutes, and allowing the resulting mixture to cool slowly, under agitation, over at least a 15 minute period to solidify the sodium on the granules, when said purification is carried out in liquid form, the alumina has a granulometry of between 0.05 and 0.5mm particle size and a specific surface area in excess of 1 sq.m./g and the sodium amount contacted with the alumina is in such a quantity that the final concentration thereof in the purifying agent is in the range of from 10 to 25 parts by weight per 100 parts of inert support and the sodium chloride is of a particle size of between 0.1 and 1 mm and the specific surface area thereof is less than 1 sq.m./g with the amount of sodium contacted therewith being in a quantity so that the final concentration thereof in the purifying agent is between 3 and 10 parts by weight per 100 parts of inert support, and when the purification is carried out in gaseous form, the alumina has a particle size of between 0.05 and 0.5 mm, the specific surface area thereof is in excess of 1 sq.m./g and the amount of sodium contacted therewith is in a quantity so that the final concentration thereof in the purifying agent is between 1 and 6.5 parts by weight per 100 parts by weight of inert support.

3,939,245
PROCESS FOR THE SEPARATION OF TUNGSTEN AND MOLYBDENUM

Andrew Irwin Bellingham, Artarmon, Australia, assignor to Warman Equipment (International) Limited, Artarmon, Australia

Filed Nov. 14, 1974, Ser. No. 523,797

Claims priority, application Australia, Nov. 19, 1973, 5700/73

Int. Cl.² C01G 39/00, 41/00

U.S. Cl. 423—55 **3 Claims**

1. A process for the separation of tungsten and molybdenum from a molybdenum- and tungsten-containing alkaline solution wherein the solution is treated in a reactor system in a continuous process, including the steps of adding sulphuric acid to maintain the solution at a pH value of about 8.5, progressively passing the solution through a series of reactor stages at elevated temperature and adding an alkali metal sulphide solution equal to no more than about the stoichiometric equivalent necessary to form the thiomolybdate ion with the molybdenum in solution, adding a further amount of sulphuric acid to maintain the solution at a pH value of 2.0 to 2.5, precipitating molybdenum trisulphide during the reaction under evolution of hydrogen sulphide, recycling said hydrogen sulphide for absorption by said molybdenum- and tungsten-containing alkaline solution, and separating the precipitated molybdenum trisulphide from the remaining solution.

3,939,246
MANUFACTURE OF CRYSTALLINE ALUMINOSILICATE ZEOLITES

Louis D. Rollmann, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,565

Int. Cl.² C01B 33/28

U.S. Cl. 423—118 **9 Claims**

1. A process for effecting conversion of kaolin-type clays to crystalline aluminosilicate molecular sieve zeolites of the faujasite type which comprises:

a. mixing the kaolin-type clay with a flux constituting a halide or carbonate of an alkali metal corresponding to between about 5 and about 20 weight percent, calculated as alkali metal oxide, of the kaolin-type clay;

b. calcining the resulting mixture at a temperature within the approximate range of 880° to 1100°C. for a sufficient time for the clay to undergo the characteristic kaolin exotherm after dehydration is completed; and

c. aging the fluxed calcined kaolin-type clay in an aqueous solution of sodium hydroxide of approximately 5 to 20 weight percent concentration at a temperature within the approximate range of 30° to 110°C. until crystallization of the aluminosilicate zeolite is achieved.

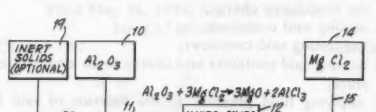
3,939,247
PRODUCTION OF ALUMINUM TRICHLORIDE AND MAGNESIUM OXIDE

Sven Fougner, 110 10th St., Garden City, N.Y. 11530

Filed Aug. 27, 1973, Ser. No. 391,747

Int. Cl.² C01F 7/60, 7/56, 5/02

U.S. Cl. 423—135 **14 Claims**



1. A method of producing aluminum trichloride and magnesium oxide which comprises reacting alumina or alumina-containing material material which reacts with magnesium chloride in accordance with the chemical equation

$$Al_2O_3 + 3MgCl_2 \quad 3MgO + 2AlCl_3$$

wherein the reaction is carried out at a temperature in the range from above about the melting point of magnesium chloride to about 2000°C. in the presence of a continually mixed mass of inert solid particulate material and wherein the resulting produced $AlCl_3$ is recovered as a vapor from the resulting produced solid MgO.

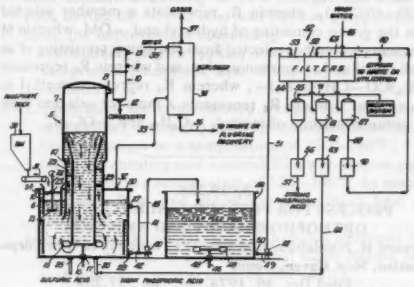
3,939,248
PROCESS AND APPARATUS FOR MANUFACTURING PHOSPHORIC ACID

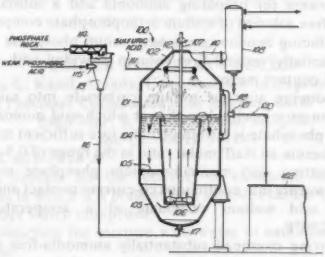
Harold B. Caldwell, Sarasota, Fla., assignor to Whiting Corporation, Harvey, Ill.

Continuation of Ser. No. 779,823, Nov. 29, 1968, abandoned, which is a continuation of Ser. No. 632,101, April 19, 1967, Pat. No. 3,416,889, which is a continuation-in-part of Ser. No. 377,012, June 22, 1964, abandoned. This application May 5, 1972, Ser. No. 250,601. The portion of the term of this patent subsequent to Dec. 17, 1985, has been disclaimed.

Int. Cl.² C01F *11/46;* **C01B** *25/22;* **B01J** *8/00*

U.S. Cl. 423—166 **18 Claims**





1. In the manufacture of wet process phosphoric acid from reactants which include phosphate rock and sulfuric acid wherein said phosphate rock and sulfuric acid are combined to produce a body of reaction slurry containing phosphoric acid and calcium sulfate, a portion of said slurry being withdrawn from said body for recovery of phosphoric acid and calcium sulfate, the improvement comprising, circulating said body of reaction slurry in a combination reactor and cooler unit, at least a portion of which is enclosed and maintained at a subatmospheric pressure, to induce evaporative cooling of said body, said evaporative cooling being conducted at a rate sufficient to maintain the temperature of said body of reaction slurry essentially constant, said body of reaction slurry being circulated in said combination reactor and cooler unit in a flow pattern adapted to expose said body to said subatmospheric pressure and at a rate sufficient to maintain substantially uniform conditions of supersaturation throughout said body, and said sulfuric acid is sprayed onto the circulating body of reaction slurry.

14. In an apparatus wherein reactants which include phosphate rock and sulfuric acid are combined to produce a body of reaction slurry containing phosphoric acid and calcium sulfate, a portion of said slurry being withdrawn from said body for recovery of phosphoric acid and calcium sulfate, the improvement comprising means for circulating said body in a combination reactor and cooler unit, at least a portion of which is enclosed and maintained at a subatmospheric pressure, in a predetermined flow pattern adapted to expose said body to said subatmospheric pressure and at a rate sufficient to maintain the temperature of said body of reaction slurry essentially constant and also sufficient to enable the maintenance of substantially uniform conditions of supersaturation throughout said body, and means for spraying the sulfuric acid onto the body of reaction slurry.

3,939,249
PURIFICATION OF TALC

Fred R. Huege, Somerville, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Nov. 7, 1974, Ser. No. 521,763

Int. Cl.² C01F *1/00*

U.S. Cl. 423—178 **7 Claims**

1. A method for removing an arsenic sulfide impurity from talc which comprises acidifying an aqueous pulp of said impure talc to a pH below 2 with an acid selected from the group consisting of sulfuric and hydrochloric, adding to said pulp an oxidizing agent having an oxidation potential with a greater negative value than −1.0 volts, maintaining the pH of said pulp below 2 until said impurity is dissolved therein, separating the talc from said pulp and washing the resulting purified talc product.

3,939,250
METHOD OF TREATING RESIDUAL GASES CONTAINING VARIOUS COMPOUNDS OF SULPHUR

Max Michel, Yerres, and Georges Dupuy, Fontenay-aux-Roses, both of France, assignors to Rhone-Poulenc Industries, Courbevoie, France

Filed June 25, 1973, Ser. No. 372,985

Claims priority, application France, June 29, 1972, 72.23497

Int. Cl.² B01D *53/34*

U.S. Cl. 423—224 **4 Claims**

1. A method of catalytic treatment of residual gases containing carbon disulphide, carbonyl sulphide and having high hydrogen sulphide content comprising the steps of passing the gases in admixture with sulphur dioxide for the Claus reaction at a temperature above 200°C into contact with catalysts consisting essentially of a carrier of active alumina having a specific surface area of at least 150 m^2/g, a pore volume of at least 0.2 cm^3/g, and a compound selected from the group consisting of the oxides, sulphides and compounds capable of being sulphurized of a metal selected from the group consisting of molybdenum, cobalt, nickel and iron present in an amount within the range of 1–15% by weight of the activated alumina.

3,939,251
REGENERATION METHOD FOR GAS TREATING APPARATUS

Sabro Tsuji, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 872,286, Oct. 29, 1969, abandoned. This application Aug. 7, 1972, Ser. No. 278,371

Claims priority, application Japan, Nov. 1, 1968, 43-79308

Int. Cl.² C01B *17/00;* **B01J** *8/00*

U.S. Cl. 423—244 **18 Claims**

1. A method of desulphurizing an exhaust gas containing sulphur oxide comprising:

1. introducing an exhaust gas containing sulphur oxide into a plurality of adsorption beds via open passageways, each bed being arranged in parallel with respect to the flow of exhaust gas and being packed with activated carbon thereby separating said sulphur oxide from said exhaust gas;
2. supplying a regenerating liquid from the top of the activated carbon layer to at least one of the adsorption beds when the a concentration of sulphur oxide adsorbed in said activated carbon has reached a predetermined value in order to regenerate said activated carbon;

3. drying said activated carbon wetted by said regenerating liquid with said exhaust gas whereby the activity of said activated carbon is increased to adsorb said sulphur oxide; said introducing of said flue gas, supplying of said regenerating liquid and drying of said activated carbon being carried out and repeated in accordance with a predetermined time schedule, the passageways for introducing said flue gas into each of said adsorption beds being kept open during said time schedule, and
4. regulating the flow rate of said flue gas in an adsorption bed to be regenerated solely with an increase in the flow rate of said regenerating liquid supplied to said adsorption bed, whereby said activated carbon in said adsorption bed to be regenerated is washed down.

3,939,252
DILITHIUM HEPTAMOLYBDOTETRAGADOLINATE

Raghvendra K. Pandey, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 6, 1974, Ser. No. 448,769
Int. Cl.² C01F *17/00*; C01G *39/00*
U.S. Cl. 423—263 **3 Claims**

1. A method for the preparation of dilithium heptamolybdotetragadolinate represented by the formula $Li_2Gd_4(MoO_4)_7$ comprising the steps of:
   a. providing a charge of gadolinium oxide (Gd_2O_3), molybdenum trioxide (MoO_3) and lithium molybdate (Li_2MoO_4) in a respective mole ratio of 2:6:1;
   b. firing the charge at a temperature above about 800° centigrade and below about 1150° centigrade;
   c. maintaining the firing temperature for a time adequate to assure molecular homogeneity in the charge;
   d. increasing the temperature to about 1130° to 1250° centigrade;
   e. cooling from about 1130° to 1250° centigrate to about 400° to 600° centigrade over a period of about 100 to 200 hours; and
   f. cooling rapidly and without control to room temperature, and at least a portion of the dilithium heptamolybdotetragadolinate is in single crystal form.

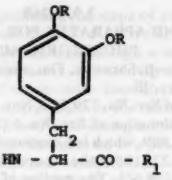
3. A method for the preparation of dilithium heptamolybdotetragadolinate represented by the formula $Li_2Gd_4(MoO_4)_7$ comprising the steps of:
   a. providing a charge of gadolinium oxide (Gd_2O_3), molybdenum trioxide (MoO_3) and lithium molybdate (Li_2MoO_4) in a respective mole ratio of 2:6:1;
   b. firing the charge at a temperature above about 800° centigrade and below about 1150° centigrade;
   c. maintaining the firing temperature for a time adequate to assure molecular homogeneity in the charge and;
   d. cooling the charge by means of the Czochralski vertical crystal pulling technique to yield a single crystal of dilithium heptamolybdotetragadolinate.

3,939,253
NOVEL, TRANSIENT PRO-DRUG FORMS OF L-DOPA USEFUL IN THE TREATMENT OF PARKINSON'S DISEASE

Nicolae S. Bodor; Kenneth B. Sloan, and Anwar A. Hussain, all of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Division of Ser. No. 412,419, Nov. 2, 1973, Pat. No. 3,891,696. This application Apr. 10, 1975, Ser. No. 566,748
Int. Cl.² A61K *31/24*, *31/195*
U.S. Cl. 424—309 **15 Claims**

1. A method for treating Parkinson's Disease in warmblooded animals which comprises administering thereto, an antiParkinsonism effective amount of a compound having the formula:



wherein R represents a member selected from the group consisting of hydrogen, $-COCH_3$, $-COC_2H_5$, $-COOC_2H_5$, and $-CO-C(CH_3)_3$; wherein R_1 represents a member selected from the group consisting of hydroxyl and —OM, wherein M represents a member selected from the group consisting of an alkali metal and an ammonium ion; and wherein R_2 represents $-(R_5)CO-CH=C(R_4)-$, wherein R_4 represents methyl or ethoxy, and wherein R_5 represents a member selected from the group consisting of methyl, $-C_6H_5$, and $-OC_2H_5$.

3,939,254
PROCESS FOR PREPARING ALKALI METAL ORTHOPHOSPHATES AND AMMONIA

Bernard H. Nicolaisen, Houston, Tex., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 30, 1974, Ser. No. 537,236
Int. Cl.² C01B *15/16*, *25/26*; C01C *1/02*; C01B *31/20*
U.S. Cl. 423—312 **19 Claims**

1. A process for preparing ammonia and a substantially ammonia-free solution of sodium orthophosphate comprising:
   a. introducing aqueous monoammonium phosphate into a substantially vertical first column provided with vapor-liquid contact means,
   b. introducing aqueous sodium carbonate into said first column at a level below that at which said monoammonium phosphate is introduced at a rate sufficient to maintain therein an Na/P molar ratio in the range of 0.5–1.5,
   c. permitting said monoammonium phosphate to flow downwardly into continuous co-current contact and react with said sodium carbonate at a temperature of 125–250°F.,
   d. removing overhead substantially ammonia-free carbon dioxide and separately recovering a bottoms product comprising a solution of sodium ammonium phosphate having a reduced carbon dioxide content,
   e. contacting said bottoms product with sufficient sodium hydroxide to provide a reaction mixture having a selected Na/P molar ratio in the range of 1–2,
   f. stripping ammonia from said reaction mixture at elevated temperature and at a pressure in the range of 130 to 500 p.s.i.g. in a second column having vapor-liquid contact means, and
   g. recovering from said second column an overhead product comprising said ammonia and a bottoms product comprising a solution of sodium orthophosphate having the selected Na/P molar ratio.

3,939,255
PROCESS FOR PRODUCTION OF AMMONIUM POLYPHOSPHATES

William Percy Moore, Hopewell, Va., and John Harvey Agee, Baton Rouge, La., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 167,810, July 30, 1971, abandoned. This application June 11, 1973, Ser. No. 368,554
Int. Cl.² C01B *15/16*, *25/26*
U.S. Cl. 423—313 **1 Claim**

1. In a process for production of ammonium polyphosphate solution which comprises the following steps:

a. providing a concentrated wet-process phosphoric acid containing 60–70% P_2O_5;

b. continuously reacting said concentrated acid with substantially anhydrous ammonia in an elongated tubular reactor at a temperature of 550°–650°F. for 5–60 seconds, sufficient ammonia being reacted with the acid to produce a reaction melt having a nitrogen to P_2O_5 weight ratio between about 0.12 and 0.18, whereby the polyphosphate content of the melt is increased to 60–90% of the total P_2O_5 without formation of insoluble reaction products; and

c. continuously quenching the resulting reaction melt in aqueous ammonia of sufficient concentration to form a clear solution containing 10–13% nitrogen and 33–37% P_2O_5 having 60–90% of the total P_2O_5 in polyphosphate form, the improvement comprising:

1. maintaining 2–10% sulfate ion in the concentrated wet-process phosphoric acid of step (a) as a corrosion inhibitor;

2. preheating the concentrated wet-process phosphoric acid utilized in step (b) in a conventional steam-heated heat exchanger to a temperature of 200°–290°F.;

3. further preheating said concentrated wet-process phosphoric acid to a temperature of 320°–500°F. by passing said melt from said reactor to an indirect heat exchanger;

4. preheating the substantially anhydrous ammonia utilized in step (b) in a conventional steam-heated heat exchanger to a temperature of 200°–440°F.;

5. further preheating said ammonia to a temperature of 320°–540°F. by indirectly heat-exchanging the ammonia with the hot reaction melt in step (b).

3,939,256

SULFUR RECOVERY PROCESS

William G. Kazel, Arvada, Colo., assignor to Cyprus Metallurgical Processes Corporation, Los Angeles, Calif.

Filed Mar. 9, 1972, Ser. No. 233,352

Int. Cl.² C01B *17/14*

U.S. Cl. 423—578 A **1 Claim**

1. A process for the recovery of elemental sulfur from mixtures in which it is present with soluble calcium compound impurities which comprises:

a. contacting the mixture with water to solubilize calcium ions;

b. separating the solids content of the treated mixture from the liquid content and washing the solids content to remove said solubilized calcium ions from the solids content;

c. forming a water slurry of said solids content;

d. adding to the slurry a surface modifying additive selected from the group consisting of alkali metal hydroxides, alkali metal carbonates, and mixtures thereof to produce an alkaline slurry pH of at least about 9;

e. heating the slurry to at least the melting point of sulfur for a period sufficient to coalesce substantially all of the sulfur particles, and

f. recovering the coalesced sulfur from the slurry.

3,939,257

PROCESS FOR PRODUCING HYDROGEN FROM WATER

Jon B. Pangborn, Lisle, and John C. Sharer, Evanston, both of Ill., assignors to American Gas Association, Arlington, Va.

Filed Aug. 20, 1973, Ser. No. 390,178

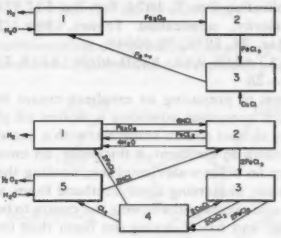
Int. Cl. C01b *1/02, 1/05, 7/08*

U.S. Cl. 423—658 **15 Claims**

1. In a reactant regenerative closed cycle process for the production of hydrogen from water the steps comprising:

providing solid ferriferrous oxide and a gaseous chloride ion yielding substance to a reaction zone to produce ferric chloride;

reducing the ferric chloride in gaseous dimer phase with a solid reducing agent selected from the group consisting of cuprous chloride, chromous chloride and platinum to produce ferrous chloride; and



then oxidizing the solid or molten ferrous compound with steam so as to produce hydrogen and ferriferrous oxide for recycle.

3,939,258

PROCESS FOR THE MANUFACTURE OF HUMAN TRANSFERRIN LABELLED WITH INDIUM 113M

Elfriede Niemann, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 9, 1973, Ser. No. 386,862

Claims priority, application Germany, Aug. 12, 1972, 2239791

Int. Cl.² A61K *43/00*

U.S. Cl. 424—1 **2 Claims**

1. A method for making human transferrin labelled with indium 113*m*, which comprises adding an eluate of an indium 113*m* generator dropwise to an aqueous human transferrin solution in a volume ratio of 1:1, said eluate having an activity concentration of 0.9 to 50 milli Curie per ml and containing 0.2 to 0.01 N hydrochloric acid and said aqueous transferrin solution containing 3 to 10 mg of sodium bicarbonate per 5 to 100 mg of human transferrin per ml.

3,939,259

COATING COMPOSITION AND THERAPEUTIC PREPARATION INCORPORATING SAME

Anthony Pescetti, 999 E. Mission Road, Fallbrook, Calif. 92028

Filed May 24, 1974, Ser. No. 473,289

Int. Cl.² A61K *9/22*

U.S. Cl. 424—20 **2 Claims**

1. A therapeutic preparation comprising a pharmaceutical gelatin capsule containing a blend of three groups of particles containing a pharmaceutically active material, said first group containing a unit dose amount of said material for release thereof within a period of one hour after ingestion, a second group of said particles containing a unit dose amount of said material being provided with a coating comprising a major proportion of zein and shellac in a weight/weight ratio of between 1:7 and about 1:14 and minor proportions of ethyl cullulose, bees wax and a plasticizer, said coating having an effective thickness for disintegration and relase of said material in a period of about 4 hours after ingestion, and a third group of said particles containing a unit dose amount of said material being provided with a coating comprising a major proportion of zein and shellac in a weight/weight ratio of between about 1:7 and about 1:14 and minor proportions of ethyl cellulose, bees wax, polyvinylpyrrolidone and a plasticizer, said coating having an effective thickness for disintegration and relase of said material in about a period of about 8 hours after ingestion.

3,939,260

THERAPEUTIC AND COSMETIC COMPOSITIONS

Victor Lafon, Paris, France, assignor to Societe Anonyme dite: Orsymonde, Paris, France

Continuation of Ser. No. 92,862, Nov. 25, 1970. This application Oct. 7, 1974, Ser. No. 512,926

Claims priority, application France, Nov. 26, 1969, 69.40803; Mar. 24, 1970, 70.10548

Int. Cl.[2] A61K 9/10; A45D 40/00; A61K 7/48

U.S. Cl. 424—28 2 Claims

1. A process of preparing an emolient cream in a porous support, which comprises admixing a molten oil phase comprising a fatty alcohol and an emulsifier with a heated aqueous phase comprising an emolient, a thickener, an emulsifier and water to form an oil-in-water emulsion; cooling the emulsion to form a cream; immersing a polyurethane foam, while compressed into said cream and allowing the cream to be absorbed into the foam; and freeze-drying the foam thus impregnated with the cream.

3,939,261

FLAVORED DENTIFRICE

Jordan B. Barth, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 30, 1974, Ser. No. 502,043

Int. Cl.[2] A61K 7/16

U.S. Cl. 424—49 15 Claims

1. An anhydrous dentifrice which contains about 10 to 90% by weight of a liquid vehicle including a hydroscopic humectant, about 0.1 to 10% by weight of a dipeptide sweetener selected from the group consisting of L-aspartyl-L-phenylalanine methyl and ethyl esters and L-aspartyl-L-hexahydrophenylalanine methyl and ethyl esters in admixture with about 0.1 to 15% by weight of a non-toxic acid anhydride selected from the group consisting of acetic-, succinic-, adipic-, fumaric-, lactic-, malic-, folic-, ascorbic-, aspartic-, benzoic-, isovaleric-, phenoxyacetic-, citric-, tartaric-, orthophosphoric-, lauric- and stearic acids and compatible mixtures thereof whereby the acid pH integrity of said sweetener is maintained about 3 to 5 and excess-free water present is absorbed thereby providing the stability in said sweetener.

3,939,262

DENTIFRICES

Keun Y. Kim, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 21, 1974, Ser. No. 435,052

Int. Cl.[2] A61K 7/18

U.S. Cl. 424—52 6 Claims

1. A translucent dental cream comprising

1. a solid phase comprising about 95 to 100% by weight, based on the total weight of the solid phase, as a polishing agent a synthetic amorphous silica prepared by exchanging hydrogen for the alkali metal ion of a particulate alkali metal silicate having an SiO_2/M_2O ratio of from about 1.6 to about 3.75 and containing 10 to 25% by weight of water, said polishing agent having an average refractive index of from about 1.410 to 1.440 and an average particle diameter of from about 1 to about 30 microns, and

2. a liquid phase comprising water and a polyhydric alcohol humectant, the refractive index of said liquid phase being essentially the same as the refractive index of said solid phase.

3,939,263

METHODS OF COMBATTING INSECTS AND ACARINA USING OXYGENATED DERIVATIVES OF S-(TERT-BULYTHIO)METHYL O,O-DIETHYL PHOSPHORODITHIOATE AND PHOSPHOROTHIOATE

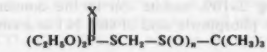
Frank Albert Wagner, Jr., Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 358,756, May 9, 1973, Pat. No. 3,878,267. This application Dec. 19, 1974, Ser. No. 534,381

Int. Cl.[2] A01N 9/36

U.S. Cl. 424—216 6 Claims

1. A method for the control of insects and acarina, comprising contacting said insects and acarina with an insecticidally or acaricidally effective amount of a compound of the structure:



where X is sulfur or oxygen and n is 1 or 2; with the proviso that when n is 1, X is oxygen.

3,939,264

METHOD FOR CONTRACEPTION BY THE ADMINISTRATION OF SEQUENTIAL CONTRACEPTIVE PREPARATIONS

Ursula Lachnit-Fixson, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Apr. 12, 1973, Ser. No. 350,590

Claims priority, application Germany, Apr. 14, 1972, 2218831; Mar. 3, 1973, 2310963

Int. Cl.[2] A61K 31/56; C07J 9/00

U.S. Cl. 424—239 6 Claims

1. A method of oral contraception which comprises administering orally to a female of child-bearing age an estrogen at a daily dosage of 0.050 mg. of 17α-ethinylestradiol for 21 days of her menstrual cycle, either (a) in combination the first 11 days with 0.050 mg. per day of d-norgestrel followed for the next 10 days by 0.125 mg. per day of d-norgestrel, or (b) in combination the first 11 days with 1 mg. of 17α-ethinyl-19-nortestosterone acetate followed for the next 10 days by 2 mg. per day of 17α-ethinyl-19-nortestosterone acetate.

3,939,265

NOVEL ZOOTECHNICAL COMPOSITIONS

Jean Andre Grandadam, 4, Rue Lhomme, 94100 Saint-Maur Des Fosses, France

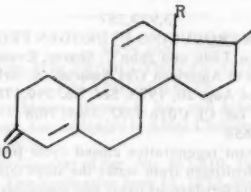
Continuation-in-part of Ser. No. 356,495, May 2, 1973, abandoned. This application Jan. 16, 1975, Ser. No. 541,387

Claims priority, application France, May 10, 1972, 72.16665; Sept. 14, 1973, 73.33060

Int. Cl.[2] A61K 31/56

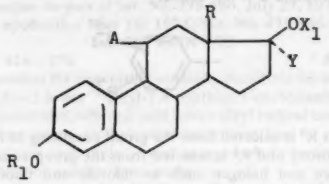
U.S. Cl. 424—239 16 Claims

1. Novel zootechnical compositions for increasing the weight of farm animals comprising a mixture of 1 to 300 mg of an anabolisant steroid of the formula



wherein R is alkyl of 1 to 4 carbon atoms and X is selected from the group consisting of hydrogen, lower alkyl optionally substituted with phenyl, lower alkenyl, lower alkoxy-lower alkyl, lower alkyl-thialower alkyl, cycloalkyl of 3 to 7 carbon

atoms, cycloalkyl lower alkyl, heterocycloalkyl, cyclic alkyl wherein the ring is derived from an unsaturated nitrogen, oxygen or sulfur heterocycle of 5 to 7 carbon atoms and acyl of an organic carboxylic or carbonic acid of 1 to 18 carbon atoms and 0.05 to 50 mg of an estrogenic steroid of the formula



wherein R is alkyl of 1 to 4 carbon atoms, R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and cycloalkyl of 3 to 7 carbon atoms, A is selected from the group consisting of hydrogen and β-alkoxy of 1 to 4 carbon atoms, Y is selected from the group consisting of hydrogen, methyl, ethynyl and haloethynyl and X_1 is selected from the group consisting of hydrogen and acyl of an organic carboxylic or carbonic aliphatic or cyclanic acid of 1 to 10 carbon atoms.

3,939,266

SUBSTITUTED SULFONYLACETAMIDO CEPHALOSPORINS

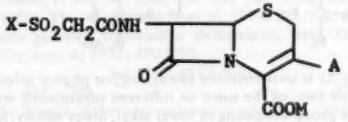
Robert M. De Marinis, King of Prussia, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 249,858, May 3, 1972, Pat. No. 3,865,819. This application Dec. 3, 1974, Ser. No. 529,207

Int. Cl.² A61K *31/54*

U.S. Cl. 424—246 5 Claims

1. A pharmaceutical composition comprising an antibacterially effective amount of a compound of the formula



where:

X is lower alkyl of C_1–C_6;

A is CH_2S-Het;

Het is a 5- or 6-membered heterocyclic ring containing one to four atoms selected from the group consisting of N, O and S, unsubstituted or substituted with from one to two groups selected from the group consisting of lower alkyl, cycloalkyl or alkenyl, each having one to four carbon atoms; lower alkoxy or alkoxyalkyl, each alkyl or alkoxy having one to four carbon atoms; hydroxy; CF_3; NHR; NR_2; SR; or halogen;

R is hydrogen or alkyl (C_1–C_4); and

M is hydrogen, alkali metal cation or nontoxic ammonium cation

and a pharmaceutically acceptable carrier therefor.

3,939,267

4-ETHERS OF 3-AMINO-5-SULFAMOYLBENZOIC ACIDS

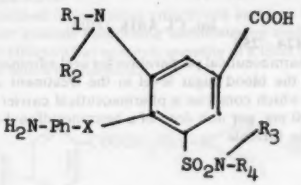
Lincoln Harvey Werner, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 13, 1972, Ser. No. 297,530

Int. Cl.² A01N *9/20*, *9/24*

U.S. Cl. 424—319 4 Claims

1. A pharmaceutical composition comprising a diuretically effective amount of a compound corresponding to the formula



in which R_1 is lower alkyl, lower alkenyl, cycloalkyl or cycloalkyl-lower alkyl, each of which with 3 to 7 ring carbon atoms, Ph is unsubstituted phenylene or phenylene substituted by one member of lower alkyl, each of R_2, R_3 and R_4 is hydrogen or lower alkyl, and X is oxygen or sulfur, or the lower alkyl esters or therapeutical useful ammonium, alkali or alkaline earth metal or acid addition salts thereof, together with a pharmaceutical excipient.

3,939,268

2,4-DIAMINO SUBSTITUTED PYRIDOL(3,2-D)PYRIMIDINE AS ANTITHROMBOTIC AGENTS

Josef Nickl; Erich Muller; Berthold Narr, and Josef Roch, all of Biberach, Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

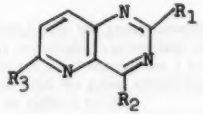
Division of Ser. No. 241,791, April 6, 1972, Pat. No. 3,843,638. This application Sept. 4, 1974, Ser. No. 503,073

Claims priority, application Germany, Apr. 10, 1971, 2117657; Feb. 23, 1972, 2208534; Feb. 23, 1972, 2208535

Int. Cl.² A61K *31/54*, *31/495*, *31/535*

U.S. Cl. 424—246 9 Claims

1. An antithrombotic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antithrombotic amount of a compound of the formula



wherein

R_1 and R_2 are each morpholino, thiomorpholino, 1-oxidothiomorpholino, 1,1-dioxidothiomorpholino or piperidino, where each of these may optionally have a methyl substituent attached thereto; piperazino; N′-formylpiperazino; N′-acetyl-piperazino; N′-carbethoxypiperazino; N′-benzoyl-piperazino; N′-methanesulfonylpiperazino; N′-p-toluenesulfonyl-piperazino; N′-carbamoyl-piperazino; N′-methyl-piperazino; di(alkanol of 2 to 6 carbon atoms)-amino; or ethylenediamino; and

R_3 is hydrogen or methyl;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,939,269

BENZENESULFON YL-SEMICARBAZIDES FOR LOWERING BLOOD SUGAR LEVELS

Walter Aumuller, Kelkheim, Taunus; Rudi Weyer, Frankfurt am Main, and Ruth Heerdt, Mannheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

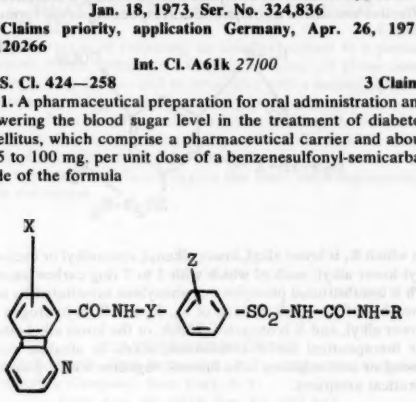
Division of Ser. No. 149,746, June 3, 1971. This application Jan. 18, 1973, Ser. No. 324,836

Claims priority, application Germany, Apr. 26, 1971, 2120266

Int. Cl. A61k *27/00*

U.S. Cl. 424—258 3 Claims

1. A pharmaceutical preparation for oral administration and lowering the blood sugar level in the treatment of diabetes mellitus, which comprise a pharmaceutical carrier and about 0.5 to 100 mg. per unit dose of a benzenesulfonyl-semicarbazide of the formula



in which

X represents hydrogen, chlorine, bromine, methoxy or methyl,

Z is hydrogen or alkylene of 1 or 2 carbon atoms, which forms together with Y a 5-membered ring,

Y represents $-CH(CH_3)-CH_2-$, or $-CH_2-CH_2-$,

R represents

a. alkylene-imino of 3 to 7 carbon atoms in the ring, which may be unsaturated or substituted by 1 or 2 methyl groups or lower alkyl group or methoxy group,

a salt thereof of a pharmaceutically acceptable base or acid.

3,939,270

PHARMACEUTICAL PREPARATIONS CONTAINING α-AMINOPENICILLINS

Bertil Ake Ekstrom, and Berndt Olof Harald Sjoberg, both of Sodertalje, Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

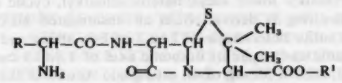
Division of Ser. No. 178,426, Sept. 7, 1971, Pat. No. 3,873,521. This application Mar. 8, 1973, Ser. No. 339,364

Claims priority, application Sweden, Sept. 17, 1970, 12688/70; Nov. 20, 1970, 15720/70

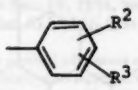
Int. Cl.[2] A61K *31/43*

U.S. Cl. 424—271 19 Claims

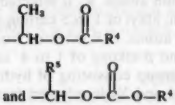
1. A pharmaceutical preparation which comprises, as an active ingredient, an anti-bacterially effective amount of at least one compound of the structural formula



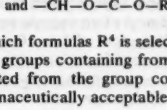
or a pharmaceutically acceptable acid addition salt thereof, in which formula R is the radical



wherein R^2 is selected from the group consisting of hydrogen and hydroxy and R^3 is selected from the group consisting of hydrogen and halogen such as chlorine and fluorine, and wherein R^1 is selected from the group consisting of



and



in which formulas R^4 is selected from the group consisting of alkyl groups containing from 1 to 4 carbon atoms; and R^5 is selected from the group consisting of H, and $-CH_3$, and a pharmaceutically acceptable carrier.

3,939,271

ANTIDEPRESSIVE AND ANTIANXIETY COMPOSITION COMPRISING 2-PYRAZOLYL-BENZOPHENONES

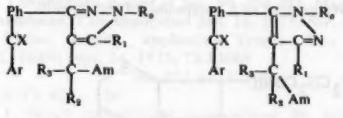
Heinz Werner Gschwend, New Providence, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 3, 1974, Ser. No. 475,475

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 4 Claims

1. An antidepressive and antianxiety pharmaceutical composition comprising a antidepressively or anxiolytic effective amount of a compound corresponding to the formulae



wherein Ar is unsubstituted phenylene, or phenyl substituted by one or two, of the same or different substituents selected from the group consisting of lower alkyl, lower alkoxy, halo or trifluoromethyl, Ph is 1,2-phenylene substituted by one or two halogen atoms, R_o is hydrogen, lower alkyl, (hydroxy, lower alkoxy or Am)C_mH_{2m} or Ar-C_nH_{2n}, wherein Am is amino, mono- or di-lower alkylamino, lower alkyleneimino or mono-aza-, oxa- or thia-alkyleneimino, wherein the additional nitrogen, oxygen or sulfur atom is separated from the iminonitrogen by at least 2 carbon atoms, *m* is an integer from 1 to 7, *n* such from 0 to 7, each of R_1, R_2 and R_3 is hydrogen or lower alkyl, and X is oxo, thio or hydrogen and hydroxy or lower alkoxy, simple or mixed, open or cyclic lower alkyl or alkylene ketals thereof; or a lower alkanoyl, alkoxycarbonyl, AmCO or AmCS derivative of the compounds containing at least one hydrogen attached to oxygen or nitrogen; or a therapeutically useful acid addition salt thereof, together with an enterally or parenterally applicable pharmaceutical excipient.

3,939,272

SOLUBILIZING PROCESS FOR OIL INSOLUBLE PESTICIDES

Frederic C. McCoy, Beacon, N.Y., and Carl Loyal W. Swanson, deceased, late of Hopewell Junction, N.Y. (by Viola C. Swanson, executrix), assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 275,680, July 27, 1972. This application May 16, 1974, Ser. No. 470,686

Int. Cl.[2] A01N 9/12

U.S. Cl. 424—276 5 Claims

1. A process for converting normally paraffinic oil-insoluble 5,6-dihydro-2-lower alkyl-1,4-oxathiin-3-carboxanilide-4,4-dioxide pesticides, wherein said lower alkyl radical contains 1 to 4 carbon atoms, to their oil-soluble form by:

a. admixing each mole of said compounds to be converted to their oil-soluble form with:

b. a molar excess of at least one alkylated phenol wherein the alkyl groups contain from 3 to 30 carbon atoms, at temperatures ranging from 20°C to 100°C until said normally paraffinic oil-insoluble compounds are converted to their paraffinic oil-soluble form.

3,939,273

3,4-METHYLENEDIOXY-CINNAMYLOXYBENZENE AS A MOSQUITO LARVICIDE

Leonard Jurd, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 5, 1975, Ser. No. 555,499

Int. Cl.[2] A01N 9/28

U.S. Cl. 424—282 2 Claims

1. A method for killing mosquito larvae which consists of applying to a body of water where the larvae are located a larvicidal amount of 3,4-methylenedioxy-cinnamyloxybenzene.

3,939,274

PHENOXYPHENYLALKANOIC ACID ESTER INSECTICIDES

Albrecht Franke, Ludwigshafen, Germany, and Walter Traber, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

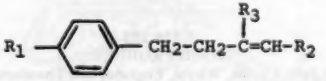
Division of Ser. No. 252,783, May 12, 1972, Pat. No. 3,824,274. This application Apr. 3, 1974, Ser. No. 457,524

Claims priority, application Switzerland, May 15, 1971, 7205/71; Apr. 6, 1972, 5087/72

Int. Cl.[2] A01N 9/24

U.S. Cl. 424—308 13 Claims

1. An insecticidal composition comprising an insecticidally effective amount of a compound of the formula



wherein R_1 represents a phenyl, phenoxy, phenylthio or cyclohexyl radical which is optionally substituted by halogen, nitro, C_1–C_5 alkyl or C_1–C_5 alkoxy, or a phenyl or cyclohexyl radical which is bonded via a C_1–C_4 alkylene, C_1–C_4 alkyleneoxy or C_1–C_4 alkylenethio bridge member, R_2 represents a (C_1–C_8 alkoxy) carbonyl, (C_3–C_6 alkenyloxy)carbonyl or, (C_3–C_6 alkinyloxy)carbonyl, radical and R_3 represents hydrogen or C_1–C_5 alkyl; together with a suitable carrier therefor.

3,939,275

METHODS AND COMPOSITIONS FOR INCREASING GROWTH RATE AND FEED EFFICIENCY OF ANIMALS

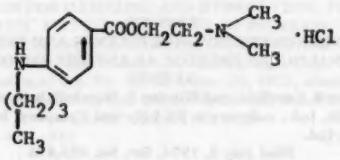
Clifton A. Baile, Glen Mills; Carol Lynn McLaughlin, Malvern, and Robert Lee Webb, West Chester, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 232,241, March 6, 1972, Pat. No. 3,839,570. This application May 2, 1974, Ser. No. 466,425

Int. Cl.[2] A61K 31/245

U.S. Cl. 424—310 4 Claims

1. The method of increasing growth rate and feed efficiency of ruminant animals comprising administering orally to said animals an effective but nontoxic quantity of a local anesthetic having the following formula:



3,939,276

CYCLIC CARBONYL COMPOUNDS

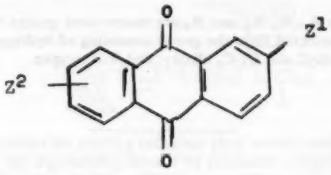
Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 287,042, Sept. 7, 1972. This application Mar. 6, 1973, Ser. No. 338,415

Int. Cl.[2] A61K 31/19

U.S. Cl. 424—317 11 Claims

1. A method of preventing the symptoms of asthma or allergic rhinitis in a mammal having asthma or allergic rhinitis which comprises administering to said mammal a prophylactically effective amount of a compound of formula



where Z^1 is selected from the group consisting of carboxyl, a pharmaceutically acceptable carboxylate salt and alkyl carboxylate wherein the alkyl moiety has 1 to 6 carbon atoms; and Z^2 is selected from the group consisting of hydrogen and a substituent Z^1 as defined herein.

3,939,277

INSECTICIDAL BIODEGRADABLE ANALOGUES OF DDT

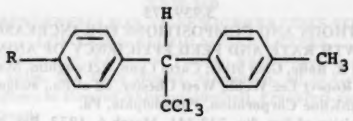
Robert L. Metcalf; Inder Kapoor, and Asha Hirwe, all of Urbana, Ill., assignors to The University of Illinois Foundation, Urbana, Ill.

Division of Ser. No. 147,247, May 26, 1971, Pat. No. 3,787,505. This application Sept. 6, 1973, Ser. No. 394,568

Int. Cl.[2] A01N 9/24

U.S. Cl. 424—340 4 Claims

1. A biodegradable insecticidal formulation comprising a major amount of a compatible inert carrier and a minor amount sufficient to provide insecticidal activity of a compound having the formula:



where R is selected from the group consisting of $-OCH_3$, $-OC_2H_5$ and $-OC_3H_7$.

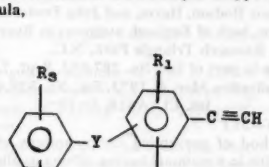
3,939,278

PHENOXYPHENYL-ACETYLENES AND THIO ANALOGUES THEREOF AS ANTITHROMBOTIC AGENTS

William B. Lacefield, and Winston S. Marshall, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed July 5, 1974, Ser. No. 485,878
Int. Cl.[2] A61K *31/085, 31/09, 31/10*
U.S. Cl. 424—340 4 Claims

1. A method of treating vascular thrombosis in warm-blooded animals which comprises administering to a warm-blooded animal in need of such treatment an amount effective for treating vascular thrombosis of a phenoxyphenylacetylene of the formula,



wherein R_1, R_2, R_3, and R_4 are monovalent groups independently selected from the group consisting of hydrogen, halo, C_1–C_3 alkyl, and C_1–C_3 alkoxy; and Y is oxygen.

3,939,279

FEED AND METHOD OF AQUIANIMALS CULTIVATION

Takatsugu Kawano; Hiroshige Kojima; Hiroshi Ohosawa, and Kazuto Morinaga, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 66,575, Aug. 24, 1970, abandoned. This application June 27, 1973, Ser. No. 373,910
Claims priority, application Japan, Aug. 22, 1969, 44-65961
Int. Cl.[2] A23L *1/28*
U.S. Cl. 426—2 13 Claims

1. A method of aquianimal cultivation which comprises feeding the aquianimal with cells obtained by aerobically culturing in a sea water medium containing waste molasses and an inorganic nitrogen compound as the sources of carbon and nitrogen, a yeast strain selected from the group consisting of

NRRL Y-7345
NRRL Y-7346
NRRL Y-7347
NRRL Y-7348 and
NNRL Y-7349

3,939,280

PROCESS FOR TREATING ANIMAL WASTE

John N. Karnemaat, Comstock Township, Kalamazoo County, Mich., assignor to General Environmental Systems Co., Inc., Warsaw, Ind.

Filed Aug. 30, 1974, Ser. No. 501,888
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—2 13 Claims

1. A process for treating poultry manure to transform same to a material suitable for use as a feedstuff for animals, which comprises the steps of:

carrying out the following steps A and B in optional sequence,

A. mixing poultry manure with an acid to neutralize the ammonia in the poultry manure, to change the pH of the poultry manure to less than 7.0 and to leave present in the poultry manure a catalytically effective amount of the acid, the acid being stable, non-toxic to animals and free of elements that cause bad taste and are unsatisfactory for animal nutrition, the mixing being carried out for a period of time effective to form a substantially uniform homogeneous mixture of said poultry waste and said acid,

B. mixing into the poultry manure an amount of formaldehyde-supplying substance effective to kill essentially all the pathogenic bacteria present in said poultry waste, the mixing being carried out for a period of time effective to form a substantially uniform homogeneous mixture of the poultry manure, the acid and the formaldehyde-supplying substance,

C. then mixing into the product from both of steps A and B, granular urea in an amount at least sufficient to react with the residual formaldehyde in the product of step B, to form urea-formaldehyde condensation products therein, and

D. drying the product of step C to a moisture content of less than about 15 percent.

3,939,281

EXTRACTION OF FAT FROM STARCH-CONTAINING VEGETABLE MATTER

Dieter Schwengers, Dormagen, Germany, assignor to Pfeifer & Langen, Cologne, Germany

Filed Nov. 9, 1973, Ser. No. 414,495
Claims priority, application Germany, Nov. 14, 1972, 2255666; Nov. 14, 1972, 2255667
Int. Cl.[2] C11B *1/04, 1/10;* C12C *11/00*
U.S. Cl. 426—11 9 Claims

1. The process for degreasing vegetable matter containing starch and fats which comprises crushing said vegetable matter, extracting the crushed matter with a normally gaseous inert solvent in liquid state at a temperature of about 20° to 100°C and below the critical temperature and a pressure of about 30 to 1000 atmospheres and above the critical pressure of the inert solvent which solvent has a critical temperature below about 200°C, separating the fat-containing solvent from the substantially fat-free vegetable residue, separating the dissolved fat from the solvent by raising the temperature to vaporize the solvent, and reducing the pressure of the fat-free vegetable residue.

3,939,282

FOOD PRODUCT

Norman John Carlile, Wirral, England, and Theodorus Johannes van Selm, Krimpen aan den Ijssel, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed May 7, 1973, Ser. No. 357,750
Int. Cl.[2] A23D *3/00*
U.S. Cl. 426—603 5 Claims

1. A plastic emulsion food spread comprising an aqueous phase and a fat phase in the form of an emulsion in which the fat phase is partly crystallized and comprises by weight of the fat phase, from about 5% to about 40% of a triglyceride com-

position, the fatty acid residues of which are in random distribution and consist essentially of the acid residues of palm oil, and a major proportion of an additional fat where said fat is selected from the group consisting of corn, cottonseed, groundnut, safflower, sunflower, sesame and soybean oils.

3,939,283

COLORED FOODSTUFFS AND BEVERAGES

Arthur Ernest Billington, Watford, assignor to Beecham Group Limited, England

Filed Aug. 13, 1973, Ser. No. 387,750
Claims priority, application United Kingdom, Aug. 19, 1972, 38787/72; Oct. 5, 1972, 45943/72
Int. Cl.² A23L *1/275*
U.S. Cl. 426—250 12 Claims

1. A foodstuff or beverage composition comprising an amount of 1-(azo-benzene-4-sulphonic acid)-2-naphthol-6, 8-disulphonic acid or an edible salt thereof sufficient to impart to the composition the desired degree of orange color in combination with a foodstuff or beverage.

3,939,284

PROCESS FOR THE PRODUCTION OF MEAT, POULTRY AND FISH ANALOGS AND THE PRODUCTS THEREOF

Cavit Akin, Naperville; Robert J. Flannery, Olympia Fields, both of Ill., and Franklin D. Darrington, Highland, Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed Jan. 29, 1975, Ser. No. 545,031
Int. Cl.² A23J *3/00*; A23L *1/30*, *1/275*, *1/28*
U.S. Cl. 426—250 25 Claims

1. A process for imparting meatlike texture to mixtures of protein materials comprising the steps of:

a. preparing a mixture of a single-cell protein material and at least one material selected from the group consisting of (1) animal protein and (2) plant protein, said mixture containing about 5 to about 50 percent of the single-cell protein component;

b. adjusting the moisture level to about 20 to about 45 percent;

c. extruding the moisturized protein mixture at temperatures within the range of 210° to 385°F. to provide a shaped extrudate;

d. drying the extrudate at temperatures ranging from about 130 to about 350°F.; and

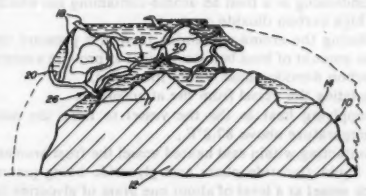
e. cooling the dried extrudate to produce a product which has meatlike chewability and resists dispersion in water.

3,939,285

METHOD OF MAKING AGGLOMERATES COMPRISED OF PARTICLES FOR CARRYING LIQUID

Charles B. Garrett, Sr.; Roger L. Garrett, both of Alexandria, and Alan B. Rubin, Fairfax, all of Va., assignors to Adams Laboratories, Inc., Alexandria, Va.

Filed Nov. 6, 1973, Ser. No. 413,214
Int. Cl.² A23C *9/00*
U.S. Cl. 426—285 10 Claims



10. A method for converting a liquid to a semi-dry granular form that is convenient to handle, the method comprising the following steps:

combining adsorptive primary carrier particles that are resistant to shearing, with a liquid, the particles insoluble in the liquid, until saturation of the particles results to form a damp material;

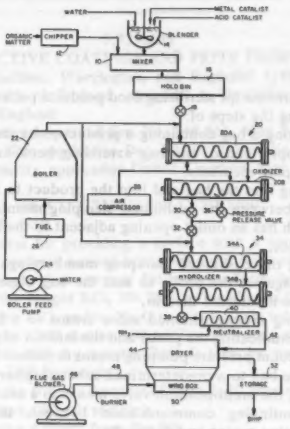
mixing thereto secondary adsorptive carrier particles, insoluble in the liquid and smaller than the primary carrier particles, for causing the formation of agglomerates, each agglomerate comprising secondary carrier particles adhering to a primary carrier particle, adjacently positioned particles of the agglomerates creating cavities filled with the liquid, the agglomerates forming a free flowing granular material with substantial surface moisture adsorbed by each agglomerate.

3,939,286

PROCESS FOR OXIDIZING AND HYDROLYZING PLANT ORGANIC MATTER PARTICLES TO INCREASE THE DIGESTABILITY THEREOF BY RUMINANTS

James W. Jelks, Rte. 1, Box 461, Sand Springs, Okla. 74063

Continuation of Ser. No. 327,414, Jan. 29, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,596
Int. Cl.² A23K *1/12*, *1/18*
U.S. Cl. 426—312 8 Claims



1. A process for treating cellulosic plant matter particles to increase the digestability thereof by ruminants comprising:

a. mixing said particles with (1) water, (2) an acid catalyst selected from the group consisting of carbonic, sulfuric, phosphoric, hydrochloric and acetic acids to produce a pH of less than 3, and (3) a metal catalyst selected from the group consisting of elemental iron, ferric chloride, ferric sulfate, ferric nitrate, elemental manganese and the non-toxic salts of manganese;

b. subjecting the resulting mixture to an oxygen partial pressure of from about 20 to 30 psig at an elevated temperature of approximately 105°C to approximately 110°C for 12 to 20 minutes; to effect an exothermic reaction of oxygen with the cellulose in said particles whereby at least a portion of the lignin-cellulose bonds of said particles are broken and at least a portion of the cellulose molelcules are fragmented; and

c. blowing off resulting gases of oxidation; and

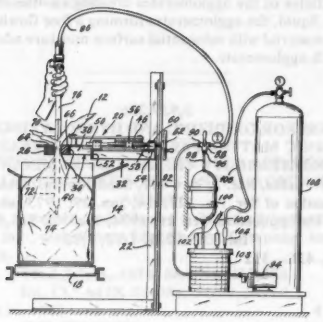
d. hydrolyzing the resulting oxidized mixture in the presence of the acid and metal catalysts added in step (a); at elevated temperature and pressure of between about 135°C and about 150°C under saturated steam conditions to convert at least a portion of the cellulose into saccharides and saccharide acids.

3,939,287

STERILIZING APPARATUS AND PROCESS

David F. Orwig, and Robert G. Roecklein, both of Kirkwood, Mo., assignors to Spicecraft, Inc., St. Louis, Mo.

Filed June 17, 1974, Ser. No. 479,987
Int. Cl.² A23L *3/34*; B65B *31/04*, *55/00*
U.S. Cl. 426—316 16 Claims



16. A process fpr sterilizing food products packaged in bags comprising the steps of:

supporting a bag containing a product to be sterilized with the open end of the bag extending between cushioned clamping members,

inserting into the bag and into the product to be sterilized and between the cushioned clamping members a probe which has an outlet opening adjacent to the inserted end thereof,

moving the cushioned clamping members against the bag and against the probe to seal the bag closed while the probe is inserted therein,

operating multi-positioned valve means to a first position communicating the probe and the interior of the bag with a vacuum pressure pumping means to reduce the pressure in the bag to a predetermined subatmospheric pressure,

moving the multi-position valve means to a second position discontinuing communication between the vacuum pumping means and the probe,

thereafter moving the multi-position valve means to a third position communicating the probe and the interior of the bag with a source of gaseous sterilant for introduction therein,

relieving some of the pressure produced by the cushioned clamping members against the probe, and

withdrawing the probe from the bag and from the product therein.

3,939,288

INHIBITION OF WARMED-OVER FLAVOR IN MEATS

Kunito Sato, Chicago, and Gerald R. Hegarty, Elmhurst, both of Ill., assignors to Armour and Company, Phoenix, Ariz.

Continuation of Ser. No. 278,061, Aug. 4, 1972, Pat. No. 3,821,444. This application June 19, 1974, Ser. No. 480,690. The portion of the term of this patent subsequent to July 2, 1991, has been disclaimed.
Int. Cl.² A22C *18/00*; A23L *1/31*
U.S. Cl. 426—332 4 Claims

1. Uncured meat which is resistant to the development of warmed-over flavor and which has incorporated therein 0.01 to 0.50 percent by weight of 3-hydroxy-2-ethyl-gamma-pyrone.

3,939,289

DRY CARBONATION SOURCE FOR A BEVERAGE CONCENTRATE AND METHOD OF PREPARING THE SAME

John Hornyak, Yonkers, and Howard D. Stahl, Hartsdale, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 2, 1973, Ser. No. 347,309
Int. Cl.² A23L *1/22*
U.S. Cl. 426—548 15 Claims

1. A process for preparing a dry carbonation source for use in preparing a carbonated beverage comprising:

co-grinding calcium carbonate and an anhydrous, solid, water-soluble nontoxic acid

wherein the cogrinding of the calcium carbonate and the acid

a. grinds the aggregates of calcium carbonate into finely-divided particles having an average primary particle size of less than about 100 millimicrons and being substantially free of aggregates in excess of about 10 microns,

b. causes intimate association of the acid with the calcium carbonate, and

c. grinds the acid to an average particle size of less than about 100 microns.

15. A process according to claim 13 wherein the sweetener comprises L-aspartyl-L-phenylalanine methyl ester.

3,939,290

WATER IN OIL EMULSION

Kimio Terada; Satoshi Fujita; Shigeru Oinuma, and Hiroshige Kohno, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Japan

Filed July 19, 1973, Ser. No. 380,734
Claims priority, application Japan, July 21, 1972, 47-72495
Int. Cl.² A23D *3/00*
U.S. Cl. 426—564 5 Claims

1. An edible water-in-oil emulsion, which is stable during storage and carriage and the phase of which can be reversed by mechanical working to form an oil-in-water emulsion, said water-in-oil emulsion comprising about 50 – 95% by weight of a continuous oil phase, about 5 – 50% by weight of a dispersed aqueous phase, a polyhydric alcohol fatty acid ester having a substantial proportion of a polyhydric alcohol unsaturated fatty acid ester in an amount of about 0.25 – 2.5% by weight of said water-in-oil emulsion, and a sucrose fatty acid ester having an HLB value of at least 10 in an amount of about 0.5 – 5% by weight of said water-in-oil emulsion.

3,939,291

GRINDER GAS FIXATION

Saul Norman Katz, Monsey, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed May 20, 1974, Ser. No. 471,633
Int. Cl.² A23F *1/04*
U.S. Cl. 426—594 8 Claims

1. A method for aromatizing soluble coffee with an aromatized glyceride comprising the steps of:

a. condensing as a frost an aroma-containing gas which has a high carbon dioxide content,

b. placing the aroma-containing frost in a pressure vessel, the amount of frost being sufficient to provide a saturated carbon dioxide phase within the vessel,

c. isolating the vessel from the atmosphere,

d. supplying heat to the the vessel to raise the internal temperature above 87.8°F.,

e. contacting within said heated vessel the frost aromas and a liquid glyceride phase said glyceride being present in the vessel at a level of about one gram of glyceride to 0.5 to 6 grams of the frost; thereafter,

f. slowly releasing pressure from the vessel in a manner which avoids the formation of liquid carbon dioxide, and then

g. combining the aroma-bearing glyceride with coffee solids.

3,939,292

PROCESS FOR STABLE PHASE III POTASSIUM NITRATE AND ARTICLES PREPARED THEREFROM

George A. Rohrer, Sault St. Marie, Mich., assignor to Technovation, Inc., Sault Ste. Marie, Mich.

Continuation-in-part of Ser. No. 76,059, Sept. 28, 1970, Pat. No. 3,728,694. This application Dec. 18, 1972, Ser. No. 316,417

Int. Cl.² B05D *3/06*

U.S. Cl. 427—55 6 Claims

1. A process for the preparation of a Phase III potassium nitrate which is stable at ambient conditions, comprising:

a. melting reagent grade potassium nitrate in the presence of a vacuum having a maximum pressure of about 1×10^{-5} torr,

b. evaporating the melted potassium nitrate at a temperature of from about 390° C to 440° C while maintaining the vacuum,

c. collecting the vapors in the form of a thin film of Phase III potassium nitrate, and

d. relieving the vacuum to atmospheric pressure and allowing the temperature to reach room temperature while maintaining a moisture-free atmosphere.

3,939,293

METHOD FOR PASSIVATING CHROMIUM

Vlasta Brusic, Mount Kisco, and Robert O. Lussow, Hopewell Junction, both of N.Y., assignors to International Business Machines, Corporation, Armonk, N.Y.

Filed Apr. 30, 1974, Ser. No. 465,657

Int. Cl.² C23F *7/02*

U.S. Cl. 427—403 11 Claims

1. A process for passivating chromium which comprises contacting chromium at a temperature of from about 425°C to about 475°C with O_2 for a period of time greater than twenty minutes to grow a passivating chromium oxide film thereon.

3,939,294

ADHESIVES AND THEIR USE

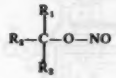
John William Fieldhouse, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 1, 1974, Ser. No. 493,796

Int. Cl.² B32B *27/40*; C08G *18/00*; B29H *5/02*

U.S. Cl. 428—424 12 Claims

1. A lamination of two rubber substrates adhered by a cured adhesive composition which comprises an organic isocyanate and an adhesive promoter having the formula



or

$$X.R(NH.COO.NO)_x$$

in which R_1, R_2 and R_3 represent a saturated or unsaturated hydrocarbyl group of 2 to 16 carbon atoms or C, R_1, R_2 and R_3 represent a hydrocarbyl group which includes a cyclic-containing aliphatic hydrocarbyl group of 5 to 7 carbon atoms, R is an aliphatic, cycloaliphatic or aromatic hydrocarbyl group of 1 t0 16 carbon atoms, X is hydrogen or —NCO or —NH-COO.NO or —NH.COO.C_6H_5 and x is 1 or 2.

3,939,295

PROTECTIVE COATINGS AND FRITS THEREFOR

Robert Robertson, Warrington, and Reginald Arthur Read, Lymm, both of England, assignors to Radiation Limited, London, England

Continuation-in-part of Ser. No. 140,566, May 5, 1971, abandoned. This application Dec. 22, 1972, Ser. No. 317,271

Claims priority, application United Kingdom, May 12, 1970, 23039/70

Int. Cl.² C32B *15/00*; C23D *5/00*

U.S. Cl. 428—539 11 Claims

1. A process for providing a surface with a catalytically-active glass ceramic coating comprising the steps of

i. producing a glass ceramic frit having a formulation lying within the ranges SiO_2 30–70% by weight: Al_2O_3 0–25% by weight: LiO_2 and/or Na_2O and/or K_2O (in total) 0-30% by weight: CaO and/or SrO and/or BaO and/or MgO (in total) 10–40% by weight: ZnO 0–10% by weight: and B_2O_3 0–20% by weight,

ii. milling the frit to a fineness of from 2–20 grams on a 200 mesh sieve (50 ml. sample),

iii. preparing a slurry from the frit,

iv. incorporating a catalyst in the slurry,

v. coating the surface with the slurry and drying the same, and,

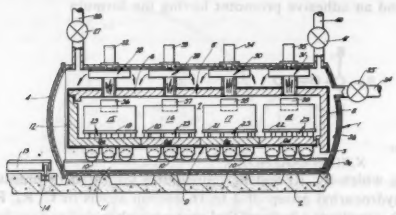
vi. firing the surface with the dried slurry at a temperature within the range of from 650°–950°C to produce a fully-fired glass ceramic coating with a porosity in excess of about 20%.

3,939,296

ANNEALING FURNACE BASE PLATE SUPPORTS

John H. Burger; John R. McClelland, both of Butler, and Robert P. Dunkle, Kittanning, all of Pa., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Sept. 24, 1974, Ser. No. 508,698
Int. Cl.² F27D *3/02, 3/12*
U.S. Cl. 13—25 19 Claims



1. In an annealing furance of the type comprising an outer enclosure surrounding an insulated heating chamber and wherein the bottom of said heating chamber comprises a metallic coil-carrying car mounting on its upper surface at least one base plate upon which a coil of metal to be anealed is located, said car having an electrical heating element above its upper surface and beneath said base plate, improved supports for said base plate on said upper surface of said car, each of said supports comprising at least one block of refractory material mounted on said upper surface of said car and upon which said base plate rests, said supports being so arranged on said upper surface of said car as to afford maximum support for said base plate whereby to prevent warping of said base plate and distortion of said coil thereon during an annealing cycle, said supports being of such height as to accommodate said heating element between said upper surface of said car and said base plate in spaced relationship to both and to permit circulation of an atmosphere about said heating element.

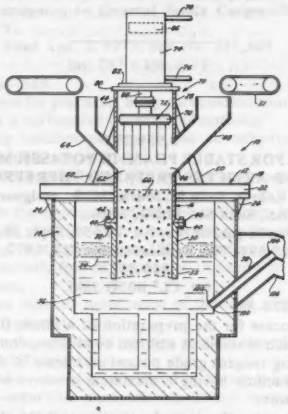
3,939,297

STOKER FEED SYSTEM

William F. Aylard, Northfield, and Albert I. Blank, Lyndhurst, both of Ohio, assignors to Chase Brass & Copper Co., Incorporated, Cleveland, Ohio

Filed Dec. 7, 1973, Ser. No. 422,858
Int. Cl.² H05B *5/14;* C21B *11/00*
U.S. Cl. 13—29 11 Claims

1. A stoker feed system for supplying metal to a electrical induction melting furnace, said stoker feed system comprising a generally vertically extending feed tube having opposed upper and lower end portions, with the lower end portion thereof being submerged below the upper surface of molten metal in said induction furnace; at least one feed chute communicating with said feed tube adjacent the upper end portion thereof for supplying a charge to said feed tube for maintaining a column of metal in said feed tube above the upper surface of said molten metal in said furnace during operation thereof; means in said feed tube for compressing said metal in said feed tube and for moving the metal column in the feed tube downwardly in the tube to push the lower portion of the metal column in the feed tube into the molten mass in said induction furnace while maintaining the height of the compressed column of metal in the feed tube within a predetermined height range to allow condensation on the metal column in the feed tube of undesirable gases flowing up the feed tube from the furnace, and a molten metal discharge conduit operatively connected to said furnace, said conduit having a first end portion located in direct communication with said furnace adjacent the bottom of the melting furnace and a second end portion located outside of the furnace at a higher elevation than said first end portion of the discharge conduit and the lower end portion of the feed tube, thereby to provide



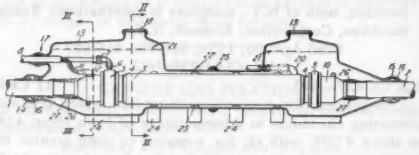
direct discharge of molten metal from the furnace while automatically and independently maintaining a relatively constant molten metal level in said induction furnace above the lower end portion of the feed tube during operation thereof.

3,939,298

JOINTS FOR ELECTRIC CABLES

Cyril Henry Gosling, London; David Glick, Rainhill, near Liverpool; Alan Leslie Powell, Bexleyheath, and William Young Murray, Prescot, all of England, assignors to British Insulated Callender's Cables Limited, London, England

Filed Feb. 12, 1968, Ser. No. 704,763
Claims priority, application United Kingdom, Feb. 15, 1967, 7323/67The portion of the term of this patent subsequent to Jan. 9, 1985, has been disclaimed.
Int. Cl.² H02G *15/08*
U.S. Cl. 174—21 R 15 Claims



1. A joint enclosure enclosing a joint between fluid impregnated metal sheathed power cables comprising a fluid-tight enclosure surrounding the conductor joint and being divided transversely into at least three parts including a central part of low thermal resistance, surrounding the joint between cable conductors, and two end parts, which electrically insulate the central part from the sheaths of the cables connected at the joint and are each sealed both to the central part and to one of the cable sheaths, in which

a. at one end of the joint a terminal passes through a ring shaped insulating part,
b. a bonding lead passes through but is insulated from the central part of the fluid-tight enclosure, and
c. the bonding lead is connected between the terminal and, at the other end of the joint, the cable sheath of one of the cable lenghts connected at the joint.

3,939,299

ALUMINIUM ALLOY CONDUCTOR WIRE

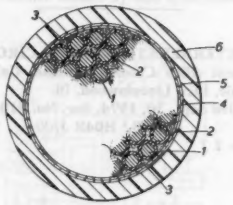
Peter Michael Raw, Harrow, England, and Rees Jenkin Llewellyn, Burnaby, Canada, assignors to British Insulated Callender's Cables Limited, London, England

Filed July 31, 1974, Ser. No. 493,532

Claims priority, application United Kingdom, Aug. 9, 1973, 37869/73

Int. Cl.² H01B 1/02; H02G 15/20

U.S. Cl. 174—23 R 14 Claims



1. A conductor wire composed of an aluminium alloy consisting of between 98.0 and 99.5 weight percent aluminium; between 0.3 and 1.0 weight percent iron; between 0.16 and 1.2 weight percent silicon; and trace quantities of conventional impurities.

3,939,300

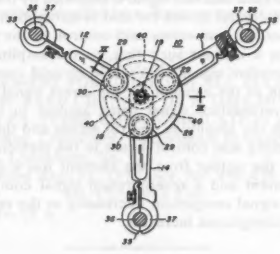
FRAMELESS DAMPING SPACER WITH CLOSE COIL SPRING

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 24, 1975, Ser. No. 552,183

Int. Cl.² H02G 7/14, 7/12

U.S. Cl. 174—42 15 Claims



1. A frameless damping spacer for overhead conductors comprising at least two elongated, rigid, spacer arms pivotally connected to each other at one of their ends adjacent a central location of the spacer, rigid pin means pivotally connecting the one end of said arms to each other, conductor clamps respectively located at the other ends of said arms remote from said central location for connecting the arms to respective overhead conductors, with each conductor clamp having a groove for receiving one of the conductors, and resilient damping means resiliently connecting the arms together, said resilient damping means having a longitudinal axis extending in a direction substantially perpendicular to the longitudinal axes of the spacer arms, and generally parallel to the axes of the grooves of the conductor clamps.

3,939,301

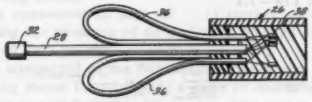
FIXED COUNT UNDERGROUND CABLE TERMINAL

William H. Channell, 122 Oak Tree Drive, Glendora, Calif. 91740

Filed Apr. 29, 1974, Ser. No. 464,853

Int. Cl.² H02G 3/00

U.S. Cl. 174—72 R 4 Claims



1. A cable junction for providing connection between a multi-line telephone cable and a plurality of service cables, comprising a housing, a single short stub length of input cable having a plurality of conductor wires in the cable, one end of the cable stub extending into the housing, a plurality of short lengths of output cables, each output cable having at least one conductor wire, one end of the output cables extending into the housing with the respective conductor wires being connected in the housing to the conductor wires of the input cable, sealing means filling the housing and permanently sealing the conductor wire connections, and means permanently sealing the other ends of the short lengths of output cable.

3,939,302

METHOD AND APPARATUS FOR RECORDING AND/OR REPRODUCING A VIDEO SIGNAL ON A PHOTOGRAPHIC RECORD DISC

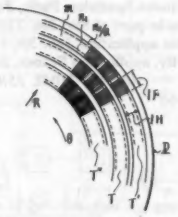
Nobutoshi Kihara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 14, 1974, Ser. No. 451,298

Claims priority, application Japan, Mar. 16, 1973, 48-30741

Int. Cl.² G11B 7/02

U.S. Cl. 178—6.6 R 24 Claims



1. A method of recording television signals having line and field intervals in substantially circular record tracks on a rotatable record disc, comprising the steps of:

pulse modulating the video information in each line interval of said television signals;

generating pilot carrier signals during at least a portion of each line interval of said television signal for use during subsequent playback of the recorded television signals to demodulate the video information;

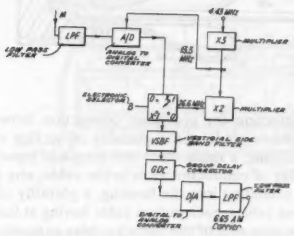
repeatedly scanning successive scan lines across the width of one of said substantially circular record tracks, said scan lines being substantially transverse to the circumferential direction of said record track; and

recording in each of said scan lines said pulse modulated video information to be recorded and said generated pilot carrier signals, said pilot carrier signals being recorded during at least a beginning or end portion of each of said scan lines.

3,939,303
DIGITAL VIDEO MODULATION APPARATUS

Frederick Henry Wise, London, England, assignor to Independent Broadcasting Authority, London, England

Filed Aug. 13, 1973, Ser. No. 387,769
Claims priority, application United Kingdom, Aug. 15, 1972, 38075/72
Int. Cl.² H04N 5/40
U.S. Cl. 178—7.1 6 Claims

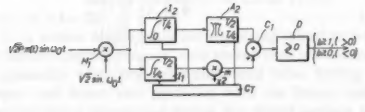


1. Apparatus for producing, at an output, digital output signals defining the timing and the levels of the peak values, and the timing of the zero values, for a sub-carrier signal amplitude modulated by a modulating signal which comprises means for providing digitized samples of the modulating signal at a rate of twice the frequency of the sub-carrier, selector means for feeding the samples to the output with alternate samples changed in value while preserving their timing relative to the remaining samples, and means for introducing nominally zero signals midway between the samples to define the occurrence of zero levels.

3,939,304
DECOMMUTATOR FOR EXTRACTING ZERO AND ONE BITS FROM A CODED MESSAGE OF DURATION-MODULATED PULSES

Andre Auguste Ribes, Toulouse, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Continuation-in-part of Ser. No. 321,968, Jan. 8, 1973, abandoned. This application Jan. 30, 1975, Ser. No. 545,743
Claims priority, application France, Jan. 7, 1972, 72.00456
Int. Cl.² H04L 15/00
U.S. Cl. 178—68 6 Claims

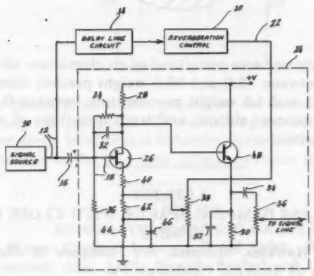


1. A decommutator for extracting 0 and 1 bits from duration-modulated pulses of a conventionally coded message in which the initial instants of the pulses are evenly spaced over a time period T and the length of which varies according to the information contained in the pulse, said pulses being first detected before being applied to the decommutator, said decommutator comprising a first integrator and a second integrator, means for applying the detected duration-modulated pulses conjointly to both said integrators, a gated storage element, a multiplying member having a constant multiplication factor, means for connecting the first integrator to the storage element so as to store therein the signals integrated by this first integrator, means for connecting the second integrator to the multiplying member so as to multiply the magnitude of the signals integrated in said second integrator by said constant factor, a comparison means having two inlets and one outlet, means for connecting the storage element and the multiplying member each to one different inlet of the comparison means, and means for controlling the integration intervals of the integrators and the gating of the storage element so that a said pulse is integrated in the first integrator over a period carrying no said information and stored in a succeeding portion of the same period and that said pulse is integrated in the second intergrator over a period carrying said information and multiplied by said factor, whereby the stored integrated signals and the multiplied integrated signals are compared in said comparison means for providing 0 and 1 bits, and means for connecting the outlet of said comparison means to a bit detector for detecting said 0 and 1 bits.

3,939,305
REVERBERATION MIXER CIRCUIT

Robert Clement Allen Crooks, Arcadia, Calif., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Filed Sept. 30, 1974, Ser. No. 510,366
Int. Cl.² H04R 3/00
U.S. Cl. 179—1 J 6 Claims



1. A circuit for mixing a direct signal with a reverberation signal comprising:
an active gain-producing element;
means for applying the direct signal to said element in a manner such that said signal is amplified by the element;
amplitude control means for said reverberation signal;
and means for connecting said control means to said element in a manner such that, as the amplitude for the reverberation signal is increased by said control means, the gain of the element for the direct signal is reduced, the reverberation signal being applied to the element through the amplitude control means and the means for connecting said control means to the element;
whereby the output from the element has a direct signal component and a reverberation signal component, the direct signal component decreasing as the reverberation signal component increases.

3,939,306
VIDEOTELEPHONE SYSTEM WITH CENTRALIZED SYNCHRONIZATION CONTROL

Virgilio Mosca, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed June 11, 1974, Ser. No. 478,282
Claims priority, application Italy, June 12, 1973, 25174/73
Int. Cl.² H04N 5/04
U.S. Cl. 179—2 TV 8 Claims

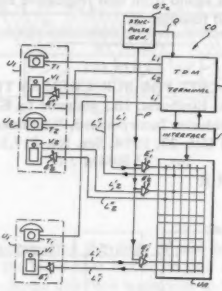
1. A videotelephone system comprising:
a central office;
a multiplicity of outlying stations served by said central office, each of said stations including a telephone apparatus with signaling means, a video transmitter provided with first sweep-control means and a video receiver provided with second sweep-control means;

circuitry connecting said stations with said central office, said circuitry including a first link extending from each video transmitter to said central office and a second link extending from said central office to each video receiver;

signal-responsive equipment at said central office for establishing a connection between two stations, said equipment including switch means with inputs tied to said first links and with outputs tied to said second links;

a source of synchronizing pulses at said central office connected in parallel to said first links;

pulse-extraction means at each of said stations connected to said second link thereof for activating said first and second sweep-control means by said synchronizing pulses;



first amplifier means inserted in said first links at said central office; and

second amplifier means inserted in said second links at said stations, said source being connected to said first links through said first amplifier means;

said first amplifier means comprising an input stage, an output stage and a network including a capacitance and a normally open electronic shunt switch connected to said first link between said stages, said electronic switch being connected to said source for periodic closure by a train of quenching pulses at the cadence of said synchronizing pulses to discharge said capacitance, said synchronizing pulses being fed by said source to said output stage.

3,939,307

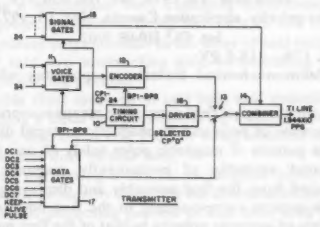
ARRANGEMENT FOR UTILIZING ALL PULSES IN A NARROW BAND CHANNEL OF A TIME-DIVISION MULTIPLEX, PULSE CODE MODULATION SYSTEM

Larry D. Bishop, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Aug. 12, 1974, Ser. No. 496,478

Int. Cl.[2] H04J *3/00*

U.S. Cl. 179—15 A **5 Claims**



1. In a carrier system having a plurality of relatively wide band, time-division multiplexed channels each represented by N sequential coded pulses, an arrangement for transmitting N data pulses in at least a selected one of said relatively wide band channels comprising:

a. respective storage means for each of said N data pulses;

b. parallel to series converting means having N inputs and one output for producing a sequential series of pulses in response to the pulses at said N inputs;

c. means connecting (N − 1) of said storage means to a respective one of said inputs of said parallel to series converting means;

d. means connected to said (N − 1) storage means for detecting the presence of an undesired state of all (N − 1) stored data pulses;

e. means connected to the Nth storage means and to said detecting means for producing a pulse of desired state in response to said detecting means detecting said presence of an undesired state of all (N − 1) stored data pulses and for producing a pulse having the same state as the data pulse stored in said Nth storage means in response to the presence of at least one pulse of desired state stored in said (N − 1) storage means;

f. and means connecting said last-named detecting means to the Nth input of said parallel to series converting means.

3,939,308

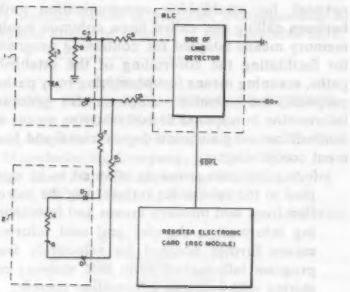
ELECTRONIC SIDE OF LINE DETECTOR

David M. Shaver, and John A. Gauthier, both of Brockville, Canada, assignors to GTE Automatic Electric (Canada) Limited, Brockville, Calif.

Filed Sept. 27, 1974, Ser. No. 510,082

Int. Cl.[2] H04M *15/36*

U.S. Cl. 179—17 A **10 Claims**



1. An improved side of line detector for a communication switching system, said system coupled to at least one line including a first and second subscriber loop connected one at a time, said first subscriber loop having a mark impedance coupled to ground, said improved side of line detector comprising:

differential amplifier means having at least two inputs for producing an output signal when said two inputs are not equal;

input voltage divider means coupled to said line including, first divider means for holding a first input of said amplifier means at a reference voltage, and

second divider means for holding a second input of said amplifier means at said reference voltage only when said mark impedance is not connected to said line;

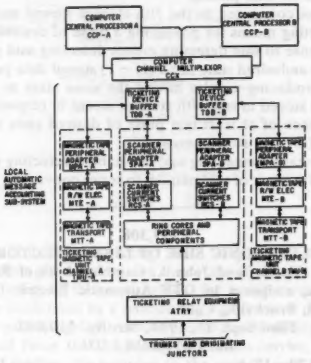
comparison output means coupled to said differential amplifier means for producing a side of line signal when said differential amplifier means produces an output signal;

whereby only when said first subscriber loop and mark impedance is connected to said line, said comparison output means will produce said side of line signal.

3,939,309
COMMUNICATION SWITCHING SYSTEM DATA RETRIEVAL AND LOADING ARRANGEMENT

William A. Malmgren, Glendale Heights, Ill., and Bryan F. Gearing, Bedford, Mass., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 18, 1974, Ser. No. 434,742
Int. Cl.² H04M 15/06; H04Q 3/54
U.S. Cl. 179—18 ES 13 Claims


COMPUTER CENTRAL PROCESSOR A CCP-A
COMPUTER CENTRAL PROCESSOR B CCP-B
COMPUTER CHANNEL MULTIPLEXOR CCX
TICKETING DEVICE BUFFER TDB-A
TICKETING DEVICE BUFFER TDB-B
SCANNER PERIPHERAL ADAPTER SPA-A
SCANNER PERIPHERAL ADAPTER SPA-B
SCANNER CONTROL CIRCUITS SCC-A
SCANNER CONTROL CIRCUITS SCC-B
RING CORES AND PERIPHERAL COMPONENTS
TICKETING RELAY EQUIPMENT ATRY
TRUNKS AND ORIGINATING JUNCTORS
LOCAL AUTOMATIC MESSAGE ACCOUNTING SUB-SYSTEM

1. In a communication switching system having a switching network for establishing communication paths selectively between calling and called lines, common equipment having memory means adapted for containing program information for facilitating the controlling of the establishment of the paths, scanning means for monitoring busy paths for ticketing purposes, the common equipment for generating ticketing information in response to said scanning means and for storing it in said memory means, a data retrieval and loading arrangement comprising:

information storage means adapted to be operatively coupled to the system for transferring the ticketing information from said memory means and for storing said ticketing information therein, and said information storage means further adapted for selectively transferring the program information from said memory means and for storing said program information therein;

adapter means responsive to the common equipment for conveying said ticketing information and said program information to said storage means for storage therein; and

status means responsive to directive information from the common equipment for controlling said adapter means to transfer to said information storage means either said ticketing information or said program information.

3,939,310
STEREOPHONIC HEADSET WITH EAR TO EAR ACOUSTICAL PASSAGEWAY

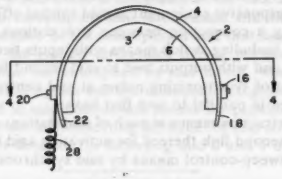
Robert B. Hodges, 1522 Jewell Ave., Topeka, Kans. 66607

Filed Aug. 9, 1974, Ser. No. 496,327
Int. Cl.² H04M 1/05; H04R 5/00
U.S. Cl. 179—156 R 3 Claims

1. A sound reproducing headset comprising:

a. a first and second earphone respectively adapted to produce sound from electrical signals, means supporting said earphones in generally opposed positions on the head of a listener and respectively in the vicinity of each of the listener's ears, and

b. means forming an enclosed, acoustical passageway having openings only adjacent said respective ears, said earphones being directed into said passageway in the respective vicinity of said passageway openings,

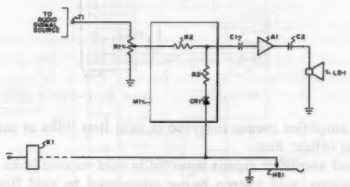


c. whereby the sound from said respective earphones intermixes in said passageway.

3,939,311
MUTING CIRCUIT FOR SUBSCRIBERS TELEPHONE

James W. Smith, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 23, 1974, Ser. No. 517,137
Int. Cl.² H04M 1/00
U.S. Cl. 179—81 R 7 Claims



1. A telephone subscriber subset including: a transducer; a hook switch connected to a source of biasing potential; an input terminal connected to a source of audio signals; and a muting circuit connected between said terminal and said transducer initially operated to couple audio signals from said terminal to said transducer at substantially the same level as received at said terminal; said muting circuit further including a circuit connection to said hook switch wherein biasing potential is conducted to said muting circuit in response to an off-hook condition of said hook switch so that the level of said audio signals conducted from said terminal to said transducer is reduced.

3,939,312
PATTERN VOICE COIL TRANSDUCER HAVING PERMANENT MAGNET PLATES OF A SINGLE POLARITY

Norman J. McKay, 1670 Kilborn Ave., Apt. 17, Ottawa, K1H 6M9, Canada

Filed Mar. 12, 1974, Ser. No. 450,379
Claims priority, application Canada, Mar. 13, 1973, 166015
Int. Cl.² H04R 9/02
U.S. Cl. 179—115.5 PV 14 Claims

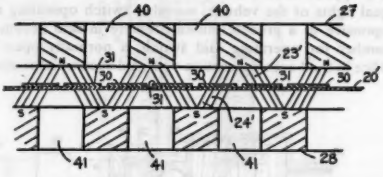
1. Electromechanical transducer apparatus which comprises,

permanent magnet field generating means comprising a first assembly of permanently magnetic material displaying a sole pattern of magnetic poles solely of one polarity, a second assembly of permanently magnetic material spaced from the first assembly and displaying a second sole pattern corresponding to the first pattern of poles solely of opposite polarity to that of the first pattern, and means orienting said assemblies relatively to one another whereby a flux pattern is set up between the first and second patterns of poles across the space separating the two assemblies consisting of a pattern of similarly di-

rected but alternately inclined field zones, said assemblies each comprising a sheet of ferrite material each displaying the respective magnetic pole pattern on one face thereof,

an electrically insulating diaphragm in said space,

conductors on said diaphragm, each conductor extending substantially across a respective field zone,



and means connecting the ends of said conductors into a circuit in the sense that forces on said conductors reinforce in a chosen direction transverse to the diaphragm to move the diaphragm when current flow is in one direction in said circuit, and forces on the conductors reinforce to move the diaphragm in the opposite direction when current flow in the circuit is in the opposite direction.

3,939,313

ROTARY SWITCH ASSEMBLY HAVING FIXED CONTACTS WHICH MAY BE SELECTIVELY SEGMENTED

Yoshikazu Hayashi, Gifu, and Mitsuo Sato, Aichi, both of Japan, assignors to Kabushiki Kaisha Tokai Riki Denki Seisakusho, Japan

Filed May 20, 1974, Ser. No. 471,562

Claims priority, application Japan, July 23, 1973, 48-87036[U]

Int. Cl.² H01H 21/62, 1/06

U.S. Cl. 200—11 J **9 Claims**

1. A rotary switch of the sliding contact type comprising

a base plate of insulating material,

a plurality of concentric, arcuate rows of stationary contact plates secured at a surface of said base plate,

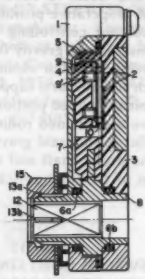
a rotary contact arm having a plurality of contacts, said rotary contact arm including a hub,

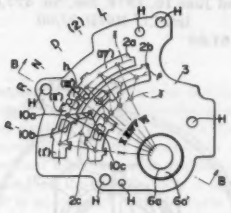
said hub including an axially projecting portion being threaded at the outer periphery thereof, and said hub having a rectangular bore extending therethrough, said hub projecting portion being formed with two intersecting grooves perpendicular to the sides of said rectangular bore, said two intersecting grooves extending through said projecting portion,

a rotatable shaft received in said hub, said rotatable shaft including a distal end portion having a rectangular cross-section, said distal end portion being inserted into said rectangular bore of said hub,

a tapered nut having a central rectangular bore, said tapered nut threadedly engaging the threaded outer periphery of said projecting portion of said hub, such that the inner faces of said rectangular bore of said projecting portion of said hub forcibly presses against said distal end portion, thereby firmly securing said rotatable shaft to said hub, and

a cover plate connected to said base plate for providing a cavity enclosing said rotary contact arm so that said contacts of said rotary contact arm slidably contact said





stationary contact plates at positions corresponding to predetermined angles of rotation of said rotatable shaft.

3,939,314

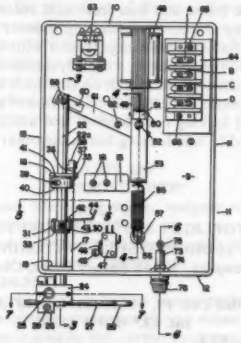
SAFETY DEVICE FOR POWER-OPERATED PRESSES AND THE LIKE

John K. Loeser, Mayfield Village, Ohio, assignor to The Positive Safety Manufacturing Company, Eastlake, Ohio

Filed June 24, 1974, Ser. No. 482,445

Int. Cl.² H01H 3/16; F16D 9/00

U.S. Cl. 200—61.42 **6 Claims**



1. In a safety device of the character described, a housing, a probe shaft mounted in said housing for vertical reciprocal sliding movement, a sensor or probe supported by said probe shaft, a solenoid mounted on said housing and having an armature movable along an axis parallel with said probe shaft, a beam mounted for pivotal movement in said housing, and operatively connected at one end with said probe shaft, said beam movable in response to energization of said armature to

permit said probe shaft and sensor or probe to fall by gravity, spring-actuated means operative in opposition to said armature for moving said beam to cause said probe shaft to be moved to a raised inoperative position, and means including an electrical circuit for controlling operation of a press or machine in response to said gravity fall, said circuit including a limit switch having a switch closing arm provided with a roller, and a switch actuator arm supported by said probe shaft and having a terminal inclined portion adapted to engage said roller, and to have a combined rolling and wedging engagement with the roller during said gravity fall, whereby bounce or vibration of the probe shaft and sensor is eliminated and positive operation of the limit switch and probe or sensor is assured.

3,939,315

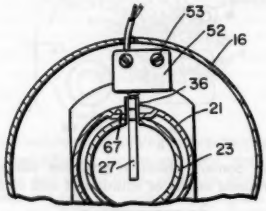
ELECTRIC SWITCH CONTAINED WITHIN LOCK FRAME AND ACTUATED BY MOVEMENT OF LOCKING BAR

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed June 10, 1974, Ser. No. 477,899

Int. Cl.² H01H *27/00*

U.S. Cl. 200—61.64 **4 Claims**



1. A door lock condition indicator comprising a lock frame, an outer hub on said frame concentric with a rotational axis, an inner hub on said frame concentric with said axis, an outer spindle rotatable in said outer hub about said axis, an inner spindle rotatable in said inner hub about said axis, a locking bar, means for mounting said locking bar in said inner spindle for movement relative to said lock frame parallel to and along said axis between a first position in non-rotational engagement with said lock frame and free from said outer spindle and a second position in non-rotatable engagement with said lock frame and in non-rotatable engagement with said outer spindle, an electric switch having a radially movable actuator, and means for mounting said switch on said lock frame with said actuator in position radially and axially free of said locking bar in one of said locking bar positions and axially engaged and radially moved by said locking bar in the other of said locking bar positions.

3,939,316

PANIC STOPLIGHT SYSTEM FOR AUTOMOBILES USING A FLUID PRESSURE SWITCHING DEVICE

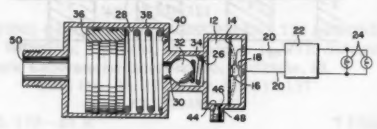
Edward J. Stropkay, 11348 Spruce Drive, Chesterland, Ohio 44026

Filed Oct. 19, 1973, Ser. No. 407,822

Int. Cl.² H01H *35/38*

U.S. Cl. 200—82 D **3 Claims**

1. A fluid pressure switching device in combination with a vehicle braking system for indicating panic braking, comprising: a fluid accumulator chamber, fluid supply means for supplying fluid to said accumulator chamber at variable rates for pressurizing said accumulator chamber, said fluid supply means including a fluid supply chamber communicating through a supply conduct with said accumulator chamber and volume reducing means for reducing the volume of said fluid supply chamber to force fluid therefrom into said accumulator chamber, a flow control check valve means in said supply conduit for preventing flow of fluid from said accumulator chamber to said fluid supply chamber, said vehicle braking system including a manually operated brake actuator and fluid conduit means through which pressure is applied by said brake actuator for applying the vehicle brakes, said brake actuator also being coupled via said fluid conduit means to supply pressure to said volume reducing means for operation of the latter in response to pressure in said fluid conduit means to reduce the volume of said fluid supply chamber for pressurizing said accumulator chamber at a rate proportional to the force applied to said brake actuator, a switch connected with signal lights of the vehicle, movable switch operating means responsive to a predetermined pressure in said accumulator chamber for operating said switch, a normally open bleed orifice in fluid communication with said accumulator chamber



for passing fluid from the latter to relieve pressure therein at a predetermined rate, said orifice being of a size to preclude pressurization of said accumulator chamber in excess of such predetermined pressure when said fluid supply means supplies fluid to said accumulator chamber at or below such predetermined rate and to permit temporarily pressurization of said accumulator chamber in excess of such predetermined pressure when said fluid supply means supplies fluid to said accumulator chamber above such predetermined rate to effect movement of said switch operating means to operate said switch, the relationship of the size of said bleed orifice, the predetermined pressure at which said switch operating means operates said switch, and the fluid pressures in said fluid conduit means in response to operation of said brake actuator being such that said switch operating means is operative to operate said switch when said brake actuator has been operated for panic braking.

3,939,317

ELECTRIC COMPRESSED-GAS CIRCUIT BREAKER

Dieter Noack, and Heiner Marin, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 12, 1974, Ser. No. 505,386

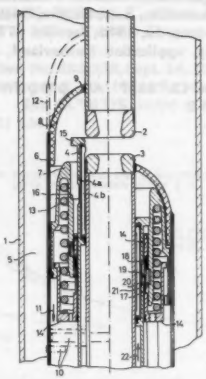
Claims priority, application Germany, Sept. 18, 1973, 2347605

Int. Cl.² H01H *33/88*

U.S. Cl. 200—148 A **6 Claims**

1. In an electric compressed-gas circuit breaker having a contact arrangement including a movable switching piece and a stationary contact piece and being equipped with a drive actuated extinguishing device for extinguishing the arc drawn as the breaker switches from the closed position to the open position, the extinguishing device comprising: a movable blast cylinder member; a blast piston member axially movable relative to said blast piston; a drive connected to one of said members and to said switching piece for moving the same when the breaker is moved between the opened and closed positions thereby imparting kinetic energy thereto during the movement between said positions; energy storage means for receiving and storing at least a portion of said energy in a manner so as to load the other one of said members therewith; engaging means for engaging said other one of said members to move the same in a direction to load said energy storage means with said kinetic energy toward the end of the movement from said closed position to said open position; and, latching means for releasing said stored energy at the begin-

ning of the next movement from said closed position to said open position to cause said other member to be propelled by



said stored energy in a direction opposite to said one member whereby additional compression of the gas is achieved.

3,939,318

ELECTRICAL PUSH-BUTTON SWITCH

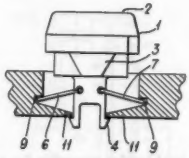
John Graham Brown, Dartford, and John Peter Stocker, London, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 25, 1974, Ser. No. 464,015

Claims priority, application United Kingdom, May 4, 1973, 21246/73

Int. Cl. H01h *13/26*

U.S. Cl. 200—159 R **7 Claims**



1. An improved electrical push-button switch of the type having a shank extending through a passage in a switch housing, and a pair of springs extending between said housing and said shank, whereby depressing said push button causes said shank to move against the tension of the springs until a cross-over point occurs, whereafter the springs assist the movement of the shank, wherein the improvement comprises:

at least one extended portion on each of said springs in cooperation with stationary extended portions on said housing so that when the push button is in its initial rest position, said extended portions of the springs are not in contact with said extended portions of said housing, and when said push button is depressed, the movement of said shank becomes opposed by the springs when said extended portion of each spring engages said complimentary extended portion of the housing, and when said button is released said shaft is restoratively returned to its rest position by means of the tension in said springs caused by the extension of said spring in cooperation with the extension on said housing.

3,939,319

HIGH-FREQUENCY HEATING DEVICE FOR VARIABLY CONTROLLING A HIGH FREQUENCY OUTPUT IN A CONTINUOUS OR STEPWISE MANNER

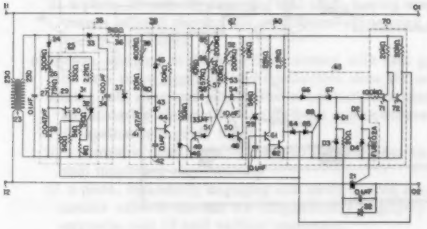
Motokazu Tamano, Yokohama; Tomimitsu Noda, and Masanobu Yoshioka, both of Fuji, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 31, 1974, Ser. No. 438,403

Claims priority, application Japan, Feb. 7, 1973, 48-15296

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 B **8 Claims**



1. A high-frequency microwave type heating device comprising a semiconductor controlled rectifying element, a transformer including a primary winding coupled through the semiconductor controlled rectifying element to an AC power source, a magnetron high-frequency oscillator coupled to a secondary winding of the transformer, a signal generating circuit operated in accordance with the cycle of a voltage of the AC power source to generate a signal at a predetermined phase angle of each cycle of the power source voltage, a pulse oscillator whose output pulse width is variable, and a control circuit supplied at least with an output of the pulse oscillator and an output of the signal generating circuit to generate a control signal, said control signal of the control circuit being used to control the semiconductor controlled rectifying element; and in which said semiconductor controlled rectifying element is a triac thyristor and said high-frequency heating device further includes an amplifying circuit for amplifying an output signal of the pulse oscillator for application to the control circuit, a delay circuit for supplying upon energization a signal to said amplifying circuit for a predetermined time period to cause the operation of the amplifying circuit to be stopped, thus preventing a pulse from the pulse oscillator from being applied to the control circuit, and a voltage detection circuit for detecting a voltage across the triac thyristor to prevent an output signal from the signal generating circuit from being applied to the control circuit when no voltage is applied across the triac thyristor.

3,939,320

BEAM STIRRER

Theodore S. Saad, Westwood, Mass., assignor to Micro-Tronics, Inc., Wisconsin Rapids, Wis.

Filed Apr. 12, 1974, Ser. No. 460,367

Int. Cl.² H05B *9/06*

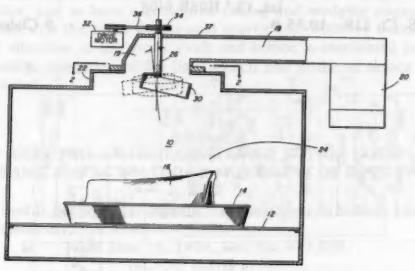
U.S. Cl. 219—10.55 F **14 Claims**

6. In a microwave oven having means defining an oven cavity, a source of microwave energy, and means coupling the energy from the source to the cavity, the improvement comprising;

a beam stirrer disposed in the oven cavity in a position to receive the coupled energy and including a cylindrical body of approximately quarter wave length height, means eccentrically supporting the structure including a shaft and tab means for securing the shaft close to one section of the body and motor means coupled to the shaft for rotating the cylindrical body to thereby deflect the beam in many directions with the energy being coupled rela-

tively uniformly as the structure rotates, wherein a small angle is provided between the center line of the shaft and the center line of the body.

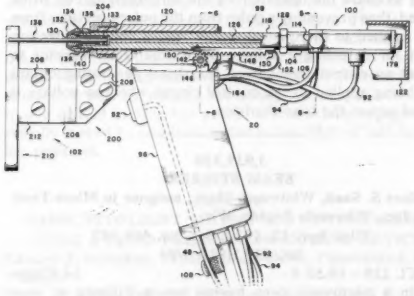
9. In a microwave oven having a source of microwave energy, a cooking cavity and waveguide means coupling from the source to an opening into the cooking cavity, a beam stirrer disposed adjacent the opening and comprising a resonant structure that represents a relatively low impedance to the energy, is disposed adjacent the opening into the cooking cavity and covers a first area intermediate the opening and cooking cavity and means for eccentrically rotating the structure to spread the energy beam without substantially disrupting the impedance to energy and so that the structure when rotating covers a second area larger than said first area and also intermediate the opening and cooking cavity.



3,939,321
PORTABLE ELECTRICAL DISCHARGE METALWORKING MACHINE

Isidore L. Q. Bertrand, and Wilford R. Hays, both of Los Angeles, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Nov. 19, 1973, Ser. No. 417,391
Int. Cl.² B23P *1/08*
U.S. Cl. 219—69 D **22 Claims**

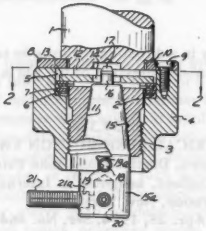


1. In a portable electrical discharge metalworking tool, the combination comprising a hollow electrode, a quill portion retaining said electrode for cooperative movement, means to supply electrical energy to said electrode through said quill, means to flow a coolant through said quill and said electrode to the work, means mounted in tandem with said quill and said electrode to vibrate said electrode with respect to the work, and means to automatically move said electrode toward the work.

3,939,322
ELECTRODE TOOL HOLDER ASSEMBLY FOR ELECTRICAL MACHINING APPARATUS

Benno Ibo Bonga, Onex, Geneva, Switzerland, assignor to Ateliers des Charmilles, S.A., Geneva, Switzerland

Filed June 10, 1974, Ser. No. 477,806
Claims priority, application Switzerland, June 15, 1973, 8680/73
Int. Cl.² B23P *1/08*; B23Q *1/08*
U.S. Cl. 219—69 R **6 Claims**

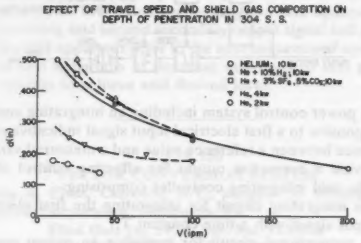


1. An electrode tool holder assembly for removably mounting an electrode tool on the ram of an electro-erosion machine, said holder assembly comprising an electrode supporting mandrel having a taper-shank portion, a tapered bore disposed in the end of said ram and adapted for coaxial engagement with said mandrel taper-shank portion, a projecting integral prong at the end of said mandrel taper-shank portion, a longitudinally displaceable sleeve disposed about the end of said ram, a peg element disposed transversely relative to the longitudinal axis of said mandrel taper-shank portion and displaceable along said londitudinal axis, means on said peg element for locking engagement with said projecting prong by rotation of said mandrel taper-shank portion relative to said peg element, biasing means for normally urging said peg element in a direction pulling said mandrel taper-shank portion in engagement with said tapered bore, abutment means on said sleeve engageable with said peg element for displacing said peg element and said mandrel taper-shank portion in a direction separating said mandrel taper-shank portion from said tapered bore when said sleeve is displaced in a predetermined direction relative to said ram, and means for angularly locating said mandrel taper-shank portion relative to said tapered bore about said longitudinal axis.

3,939,323
SHIELDING GAS FOR LASER WELDING

Richard J. Meehan, deceased, late of Mamaroneck, N.Y. (by Linda B. Meehan, administratrix); Richard H. Rein, Millwood, and Ralph H. Willgohs, Yorktown Heights, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 288,938, Sept. 14, 1972, abandoned.
This application Aug. 13, 1974, Ser. No. 497,124
Int. Cl.² B23K 26/00
U.S. Cl. 219—121 LM 3 Claims

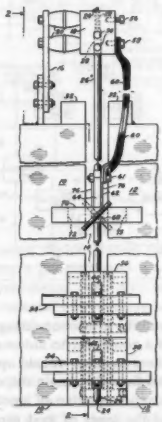


1. A method for deep penetration welding of metallic workpieces with a laser beam which comprises directing said beam to the workpiece and shielding the weld zone with a shielding gas consisting essentially of a mixture of helium and less than 20% by volume of an electronegative gas.

3,939,324
APPARATUS FOR WELDING A JOINT BETWEEN TWO CLOSELY SPACED VERTICAL MEMBERS

Wendell V. McDowell, Pottstown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 7, 1974, Ser. No. 512,381
Int. Cl.² B23K 9/12
U.S. Cl. 219—126 1 Claim



1. Apparatus for butt welding a joint between two closely spaced vertical members comprising:

a. a pair of removable liquid weld retaining shoes disposed on each side of said joint, each of said pairs of shoes having a facing spanning said joint and being disposed substantially in registry with the shoes on the opposite side of said joint,

b. a conductive electrode guide tube holder disposed at a point above said joint,

c. a conductive consumable electrode guide tube secured to said holder and extending to about the bottom of said joint,

d. a conductive shoe, adapted to be placed in contact with said guide tube at a point intermediate the length of said joint, comprising:

i. a contact element having its front end contoured to fit against said guide tube;

ii. a rotatable shaft slidably inserted into the rear end of said contact element; and

iii. a plate, threadedly engaging said shaft, having magnet means affixed thereto for magnetically engaging said vertical members,

e. means, adapted to be placed in contact with said guide tube at a point opposite said conductive shoe for maintaining said shoe and guide tube in contact, comprising:

i. an insulating element having its front end contoured to fit against said guide tube;

ii. a rotatable shaft slidably inserted into the rear end of said insulating element; and

iii. a plate, threadedly engaging said shaft, having magnet means affixed thereto for magnetically engaging the opposite side of said vertical members,

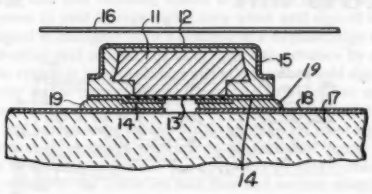
f. power supply means connected to said guide tube holder, and

g. conductive means connected from said guide tube holder to said conductive shoe.

3,939,325
THERMAL RECORD PRINTER HEAD AND METHOD OF MAKING THE SAME

Hiroshi Otani, Shijonawate, and Fujio Oda, Ashiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 29, 1973, Ser. No. 420,319
Claims priority, application Japan, Dec. 1, 1972, 47-121024
Int. Cl.² H05B 1/00
U.S. Cl. 219—216 7 Claims



1. A thermal record printer head comprising:

a semiconductor substrate having a front surface and a back surface;

an impurity diffused layer formed in the front surface of the semiconductor substrate to be adjacent to a thermosensitive recording medium;

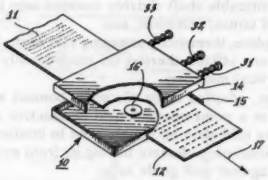
further impurity diffused regions formed in the back surface of said semiconductor substrate and extending through side portions between said front and said back surfaces of said semiconductor substrate to said impurity diffused layer and to be electrically connected therebetween and to make at least said impurity diffused layer work as an exothermic resistive layer; and

electrodes provided on said further impurity diffused regions in the back surface.

3,939,326
DUAL RIBBON FUSER

Mark A. Hutner, Glenview, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1975, Ser. No. 538,705
Int. Cl.² H05B 1/00
U.S. Cl. 219—216 5 Claims

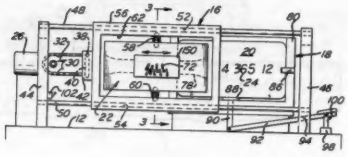


1. Apparatus for fixing toner on a substrate, as the substrate is moved through a zone, comprising:
   a. first and second members disposed on opposite sides of said zone;
   b. an electrical power source;
   c. a pair of electric heating elements, connected in series, coupled to the power source;
   d. means coupling the heating elements to said first member for heating the zone; and
   e. means, responsive to the temperature in the zone, for shorting out one of the heating elements when the temperature in the zone is lower than a predetermined temperature.

3,939,327
OPTICAL READING APPARATUS AND METHOD

John H. Humphrey, Los Angeles, Calif., assignor to Data Source Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 848,769, Aug. 5, 1969, abandoned. This application Apr. 5, 1972, Ser. No. 241,180
Int. Cl.² G06K 7/10; G08C 9/06; G06K 9/00
U.S. Cl. 235—61.11 E 36 Claims

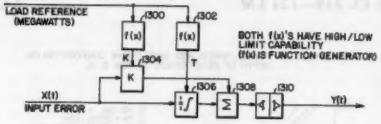


1. Apparatus for reading a font of indicia carried by a substantially planar substrate and displaced from the plane thereof, comprising a plurality of sets of detector means in spaced relation from said substrate, each of said sets comprising a light source and a light sensor, said light source and said light sensor in each set being on an angle with respect to said substrate so that light from said source will be reflected from the plane of said substrate to said sensor, said light sensor being positioned with respect to said light source to detect light reflected from the plane of said substrate and at least a reduction in the amount of reflected light due to the presence of at least a part of the indicia of said font which impedes the reflection of light to said detector, means associated with said light sensors for generating a signal having informational value indicative of the indicia detected, and each of said sets of light conducting means being positioned to sense the presence of a different portion of said font.

3,939,328
CONTROL SYSTEM WITH ADAPTIVE PROCESS CONTROLLERS ESPECIALLY ADAPTED FOR ELECTRIC POWER PLANT OPERATION

Guy E. Davis, Martinez, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1973, Ser. No. 413,272
Int. Cl.² F01K 7/16; F01D 17/00; G05B 11/42
U.S. Cl. 235—150.1 28 Claims

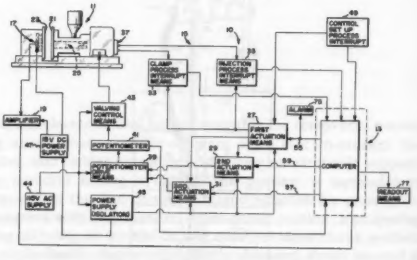


1. A power control system including an integrating controller responsive to a first electrical input signal indicative of the difference between a reference value and a measured variable to provide a corrective output for effecting control of the variable, said integrating controller comprising:
   a. an integrating circuit for integrating the first electrical input signal with a time constant T;
   b. a proportional circuit for providing an output proportional to the first electrical input signal in accordance with a gain constant K;
   c. a summing circuit responsive to the outputs of said integrating circuit and said proportional circuit to provide the corrective output; and
   d. function generator means responsive to a second electrical input signal indicative of a system's control index for independently varying the gain K and the time constant T as a selected function of the system's control index.

3,939,329
INTERFACE MEANS

J. Robert Doran, Warren, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 26, 1974, Ser. No. 500,442
Int. Cl.² G06F 15/46, 3/00; B29F 1/00
U.S. Cl. 235—151.1 16 Claims



1. Interface means for interconnecting a sequentially actuated apparatus and a computer to automatically maintain at a desired level a process variable of said apparatus wherein said computer is adapted for receiving a response signal from said apparatus during each sequence of operation, said response signal indicative of the level of said process variable during each of said sequences of operation, said computer further adapted for comparing said response signal to a reference signal representative of said desired level for said process variable and providing a first output signal of continuous nature and at least one of two secondary output signals, a first of said secondary output signals indicative that said level of said process variable is less than said desired level, a second of said secondary output signals indicative that said level of

said process variable is greater than said desired level, said interface means comprising:

first actuation means operatively connected to said computer and said apparatus for receiving said first continuous output signal and actuating said computer to receive said response signal from said apparatus;

second actuation means operatively connected to said computer, said first actuation means, and said apparatus for receiving said first secondary output signal and actuating said apparatus prior to the next sequence of operation of said apparatus to increase said level of said process variable to achieve said desired level; and

third actuation means operatively connected to said computer, said first actuation means, and said apparatus for receiving said second secondary output signal and actuating said apparatus prior to the next sequence of operation of said apparatus to decrease said level of said process variable to achieve said desired level.

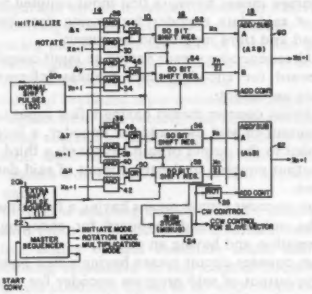
3,939,330
VECTOR CONVERSION SYSTEM

Francis A. Fluet, Clarence, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, PA

Filed Oct. 10, 1974, Ser. No. 513,915

Int. Cl.² G05B *19/18*; G06F *15/46*

U.S. Cl. 235—151.11 **12 Claims**



1. A vector conversion digital system for a numerical contouring control having a programmed machine path with at least two axial displacements ΔX, ΔY, with a given cutter radius RCRAD, the vectoral conversions being consummated prior to the incremental commanded displacement of said cutter, comprising:

a. means for master vector rotation and multiplication for receiving signals which are a function of said displacements ΔX, ΔY, and for delivering a counter rotational control signal, and an RSS signal where:

$RSS = \sqrt{\Delta X^2 + \Delta Y^2}$ and

b. means for slave vector rotation and multiplication connected to receive said counter rotational control signal, and input signals which are 0 and a function of RCRAD respectively, and for delivering output signals IRC and JRC which are the orthogonal components of RCRAD, which components, when interchanged, position RCRAD normal to said programmed machine path.

3,939,331
RAILROAD TRACK SURVEY APPARATUS

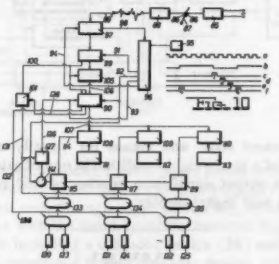
Josef Theurer, Vienna; Keith L. Hall, Linz, and Franz Egleer, Ohlsdorf, all of Austria, assignors to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H., Vienna, Austria

Continuation-in-part of Ser. No. 316,028, Dec. 18, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 452,202

Claims priority, application Austria, Dec. 24, 1971, 11119/71

Int. Cl.² G01B *7/14*

U.S. Cl. 235—151.32 **18 Claims**



1. A system for monitering the deviation in a first or second direction of the actual position of a track from a desired position along a predetermined length of said track, comprising, in combination, error signal means for furnishing an error signal having an amplitude corresponding to the amplitude of said deviation and a positive and negative sign for deviations in said first or second direction respectively; transfer signal furnishing means connected to said error signal furnishing means for furnishing a transfer signal in response to a change in said sign of said error signal; storage means connected to said error signal furnishing means to be reset in response to a reset signal, for furnishing a storage signal only if the maximum amplitude of said error signal following receipt of one of said reset signals exceeds a predetermined amplitude; first and second counting means; activating means connected to said transfer signal furnishing means, said storage means and said counting means and responsive to said transfer signal for activating said first counting means to advance by one count in response to said storage signal only when said sign of said error signal is changing from a positive to a negative sign and for activating said second counting means to advance by one count in response to said storage signal only when said sign of said error signal changes from a negative to a positive sign; and reset means connected to said transfer signal furnishing means and said storage means for furnishing said reset signal to said storage means in response to said transfer signal but after a delay time sufficient for operation of said counting means, whereby the count on said first and second counting means signifies the number of track length intervals between successive substantially zero deviations of said track position wherein said amplitude of said deviation exceeded an amplitude corresponding to said predetermined amplitude of said error signal in said first and second direction respectively.

3,939,332
ZERO INDICATOR FOR PLURAL SCALE SYSTEMS

Roger B. Williams, Jr., Sylvania, Ohio, and Richard C. Loshbough, Temperance, Mich., assignors to Reliance Electric Company, Pepper Pike, Ohio

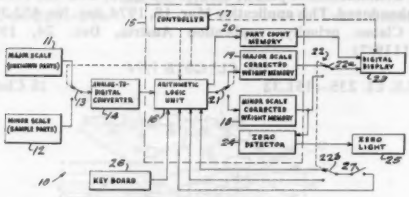
Filed June 27, 1974, Ser. No. 483,646

Int. Cl.² G01G *9/413*, *13/14*

U.S. Cl. 235—151.33 **11 Claims**

11. A weight measuring apparatus comprising, in combination, at least two scales, each of said scales being adapted to generate a weight output signal, a digital display, switching means for applying the weight output signal of one of said

scales to said display when said switching means is in a first state and for applying the weight output signal from another one of said scales to said display when said switching means



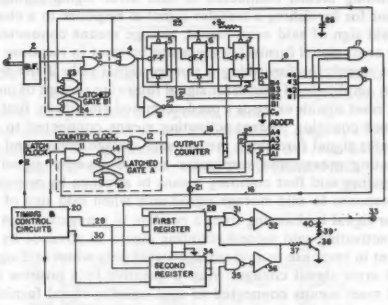
is in a second state, and means for visually indicating the existence of a zero weight condition in one of said scales when the weight output signal from another of said scales is being applied to said digital display.

3,939,333

PREVIOUS EVENTS MEMORY

Eugene Elwin Keech, Santa Ana, Calif., assignor to Electronic Engineering Co. of California, Santa Ana, Calif.

Filed Aug. 9, 1974, Ser. No. 495,949
Int. Cl.² H03K *21/30, 5/18*
U.S. Cl. 235—153 AP **8 Claims**



1. The method of uninterruptedly storing and then retrieving an unlimited series of input digital electrical signal transitions subsequent to the occurrence of the same in real time, which includes the steps of;

a. electrically digitally counting the number of transitions of said input digital electrical signal,

b. separately electrically digitally counting internally generated pulses,

c. comparing the count of said transitions of said input signal with a separate digital count of said internally generated pulses to detect nonequivalence between these two counts,

d. periodically advancing the count of said internally generated pulses as long as nonequivalence exists between said two counts,

e. terminating the advance of count of said internally generated pulses as soon as said two counts become equivalent, and

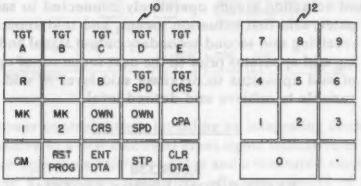
f. utilizing the least significant bit of said count of said internally generated pulses as the digital output signal.

3,939,334

CLOSEST POINT OF APPROACH CALCULATOR

Albert Roth, and Gary M. Holma, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 2, 1975, Ser. No. 537,971
Int. Cl.² G06F *15/02, 15/50*
U.S. Cl. 235—156 **5 Claims**



1. Apparatus for computing closest point of approach parameters from target and own ship data taken at different times, said apparatus comprising:

a keyboard for generating signals represent a parameter to be calculated and for generating input data signals and including a re-set terminal;

data encoder circuit means having an input coupled to said keyboard for encoding the data signals generated by said keyboard and having an output;

data storage means having a first input coupled to the output of said data encoder for storing data and having second and third inputs and an output;

data address encoder means having an input coupled to said keyboard for encoding data address information and having an output;

data address counter means having a first input coupled to the output of said data address encoder, a second input coupled to the output of said keyboard, a third input and an output coupled to the third input of said data storage means;

program encoder circuit means having a first input coupled to the output of said keyboard for encoding program information and having an output;

program counter circuit means having a first input coupled to the output of said program encoder for providing an output signal in response to the particular parameter signal generated by said keyboard and having an output, second, and third, and fourth inputs;

program read-only memory circuit means having an input coupled to the output of said program counter and providing a control and address output, an increment counter output coupled to the second input of said data address counter, a control output, an instruction output and a jump output connected to the second input of said program counter;

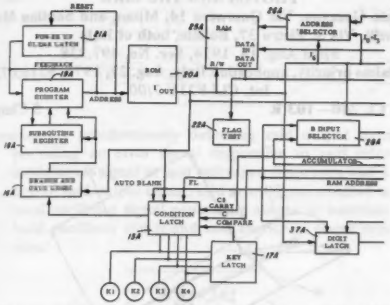
a central processing unit coupled to said control and instruction outputs of said program read-only memory and to the output of said data storage means for computing a selected parameter in response to the control and instruction signals from said program read-only circuit means and providing termination signal at a first output of the computation and having a second output coupled to a display for displaying the computed results;

clock means having a first input connected to said keyboard and being responsive to a start output signal for providing output clock signals to a third input to said program counter for starting a computation and for discontinuing said clock pulses in response to the termination pulse from said control processing unit.

3,939,335
UNIVERSAL CONDITION LATCH IN AN ELECTRONIC DIGITAL CALCULATOR

George L. Brantingham, Richardson; Louis H. Phillips, Dallas, and Larry T. Novak, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 26, 1974, Ser. No. 527,510
Int. Cl.[2] G06F 15/02
U.S. Cl. 235—156 16 Claims



1. In a calculator system having data storage means, an arithmetic unit for performing operations on data and control circuitry for providing commands which define the operation of the system, a condition latch circuit arrangement comprising:

a. a bistable condition latch;

b. a comparator circuit in said arithmetic unit having inputs for receiving sets of data, said comparator circuit for comparing pluralities of said sets of data and generating condition signals to set said condition latch in accordance with the results of said comparisons;

c. a plurality of keyboard input terminals arranged to accept input signals from a keyboard, said keyboard input terminals being coupled to said condition latch for setting said condition latch in accordance with the logical OR of input signals from selected ones of said keyboard terminals; and

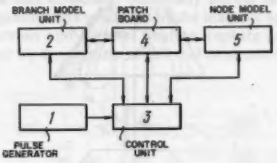
d. selector means coupling said comparator circuit and said keyboard input terminals to said condition latch for the selective setting of said condition latch, said selector means being responsive to said control circuitry for selecting said condition signal to set said condition latch in response to compare commands from said control circuitry and for selecting the logical OR of input signals from selected of said keyboard input terminals to set said condition latch in response to test key commands from said control circuitry.

3,939,336
APPARATUS FOR ANALYSIS OF NETWORK DIAGRAMS

Vsevolod Viktorovich Vasiliev, Prospekt 40 let., Oktyabrya 82, kv. 60; Alexandr Georgievich Dodanov, Dneprovskaya naber. 119, kv. 140; Alla Nikolaevna Klepikova, ul. Grekova, 13, Kv. 16 and Anatoly Grigorievich Timoshenko, Brest-Litovsky prospekt, 4, kv. 44, all of Kiev, U.S.S.R.

Continuation-in-part of Ser. No. 432,648, Jan. 11, 1974, abandoned, Continuation of Ser. No. 316,710, Dec. 20, 1972, abandoned, which is a continuation of Ser. No. 98,275, Dec. 15, 1970, abandoned. This application Dec. 2, 1974, Ser. No. 528,698
Int. Cl.[2] G06G 7/48; G06F 15/56
U.S. Cl. 235—184 11 Claims

1. An apparatus for analysis of network diagrams, comprising: a pulse generator; a branch model unit, the number of branch models wherein is equal to that of branches in the network diagram and each branch model includes a time interval forming unit having an input (15) which serves as the input of said branch model; a branch model state indication unit having at least three terminals, one of the terminals being connected to the output of said time interval forming unit, the second terminal (9) being connected to said input (15) of said branch model, and the third terminal serving as the output

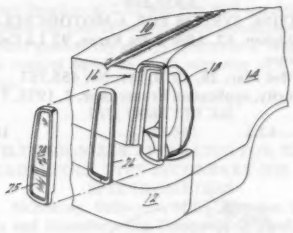


(16) of said branch model; a patch board whose terminal jacks (17) are connected to the inputs (15) and outputs (16) of said branch models and, through patch cords (18), to one another in accordance with the topology of the network diagram; and a control unit including a calendar device (26) and a control subunit (25) connected to said calendar device, patch board, pulse generator and branch model unit.

3,939,337
VEHICLE LAMP CONSTRUCTION

Roy Oda, Westland; Garry O. De Frayne, Pontiac, and Paul L. Walker, Royal Oak, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 7, 1973, Ser. No. 422,808
Int. Cl.[2] B60Q 1/02
U.S. Cl. 240—8.3 4 Claims



1. A repairable lamp unit comprising a housing having a cavity for location therein of a lamp bulb, a lens for covering the open end of said cavity and in cooperation with said housing enclosing said lamp bulb, and a pliable tacky substantially noncuring elastomeric material having a surface in adhering contact with said housing and a second surface portion in adhering contact with said lens, said lens and housing being releasably held in a sealed and assembled relationship by said elastomeric material with said elastomeric material permitting removal of said lens from said lamp unit without damage of said lens and housing, said elastomeric material forming the sole means by which the lens is joined to said housing.

3,939,338
COMBINED TERRARIUM AND LAMP

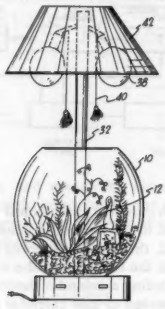
Nicholas A. Giammalvo, New York, N.Y., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Jan. 8, 1975, Ser. No. 539,260
Int. Cl.[2] F21S 13/12; F21V 33/00
U.S. Cl. 240—10 P 3 Claims

1. A lamp comprising:

a transparent bowl containing a terrarium; said bowl having a horizontal bottom portion;

first means supporting the bowl and containing at least one first light source positioned to illuminate the terrarium from below, said first means including a shallow hollow vertical cylinder open at its top end, said portion resting on said top end, and a retaining ring securing said portion to said cylinder;



a hollow vertical rod sealed in the bowl and extending outward therefrom;

a least one second light source secured to the top of the rod and provided with an on-off switch; and

second means including a two cable conductor extending into the first means, connected directly to the first source, extending through said rod and connected through said switch to said second source to supply electrical energy to all of said sources.

3,939,339

LIGHTING SYSTEM FOR A MOTORCYCLE

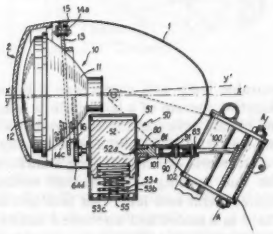
Jacques M. Alphen, 67, Allée Jules Verne, 92 La Celle Saint-Cloud, France

Filed Mar. 28, 1974, Ser. No. 455,757

Claims priority, application France, Apr. 2, 1973, 73.11767

Int. Cl.² B60Q *1/10*

U.S. Cl. 240—62.2 **18 Claims**



1. A headlight for use with a two-wheeled vehicle, such as a motorcycle, having a body and handlebars pivotable with respect to the body, the headlight comprising:

a frame fixed with respect to the handlebars of the vehicle

light-projecting means carried by said frame, said light projecting means having an optical axis along which light is projected therefrom,

support means for rotatably supporting said light-projecting means with respect to said frame, said light-projecting means being rotatable about an axis extending in a front-to-rear direction of said light-projecting means and at a small acute angle to said optical axis, and

means operative when the vehicle makes a turn for rotating said light-projecting means about its axis of rotation from the position it occupies when the vehicle is upright and traveling in a straight line, the amount of rotation at any moment being a function of the angle of inclination which the vehicle makes at that moment with the vertical.

3,939,340

DIFFUSED LIGHT REFLECTING SCREEN FOR TAKING PHOTOS AND THE LIKE

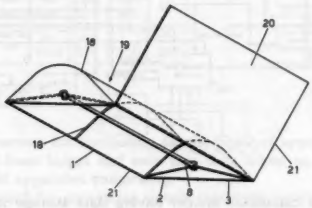
Renato Gozzano, Via Quarnero 14, Milan, and Santino Martinelli, Via S. Pietro 37, Bollate, both of Italy

Filed Aug. 14, 1974, Ser. No. 497,238

Claims priority, application Italy, Aug. 27, 1973, 52183/73

Int. Cl.² F21V *7/00*

U.S. Cl. 240—103 R **5 Claims**



1. A foldable reflecting screen for taking photos and the like characterized by the fact that it is constituted of a carrying skeleton defining an inner space of parabolic cross section having a base rectangular frame and which is formed of members which are articulated to each other and of members which can be connected to each other by disengageable means so that the skeleton components can be partly disassembled and partly folded so as to occupy a minimum space or according to an opposite sequence of operations can be brought in their use position, and of an outer covering which comprises a first portion made of flexible, opaque sheet material having a white inner surface and a dark outer surface and designed to cover the parabolic surface defined by said skeleton, and a second portion made of translucent flexible material to screen the rectangular base of said skeleton and which is at least disconnectably connected with the first portion along their edges, said base frame comprising two side rods and cross members, near the ends of said longitudinal rods of the rectangular frame and at least on one intermediate point first fittings being provided to disassemblably receive the ends of said cross members, and other fittings to disassemblably receive the ends of curved centering parabolic rods.

3,939,341

PHASE-LOCKED OPTICAL HOMODYNE RECEIVER

Ross E. Graves, Pacific Palisades, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 2, 1975, Ser. No. 564,579

Int. Cl.² H03D *1/24*; H04B *1/30*, *9/00*

U.S. Cl. 250—199 **11 Claims**

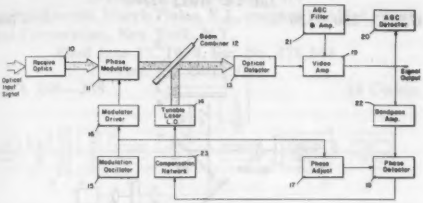
1. A phase-locked optical homodyne receiver comprising, in combination:

means for receiving an optical input signal, said input signal being characterized by a carrier frequency and information-containing modulation components;

controllable means for generating an optical local oscillator signal having substantially the same frequency as said carrier frequency;

modulating means for phase modulating one of said signals with a reference modulation signal having a frequency which is substantially low compared to said carrier frequency;

means for combining said phase-modulated signal with the other of said signals;
means for optically detecting said combined signals;
means for deriving an output signal from said optically detected signals; and



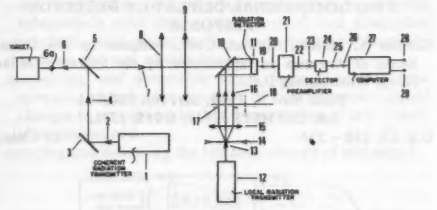
means for synchronously detecting said output signal by providing an error signal responsive to said reference modulation signal at said reference frequency and a portion of said output signal, said error signal coupled to said local oscillator signal generating means to maintain said local oscillator signal and said carrier in phase synchronism.

3,939,342

DEVICE FOR MEASURING AN ANGULAR DEVIATION BY HETERODYNE DETECTION

Jean Pierre Bezerie, Ville D'Avray, and Michel Benoit Sirieix, Jouy-En-Josas, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Mar. 28, 1974, Ser. No. 455,529
Claims priority, application France, Apr. 4, 1973, 73.12068
Int. Cl.² G01J 1/20
U.S. Cl. 250—203 R **6 Claims**



1. A device for measuring an angular deviation by a space-time modulated heterodyne detection comprising a coherent optical radiation transmitter pointed at a target, a local transmitter of a coherent optical radiation having the same wavelength as the preceding radiation, a photovoltaic detector, means for focussing at a point on said detector the radiation reflected by the target, and means for converting the radiation of the local transmitter into a beam of parallel rays and causing said beam of parallel rays to impinge perpendicularly on the surface of said detector, wherein the means for space-time modulating the heterodyne detection are interposed in the path of the radiation from the local transmitter.

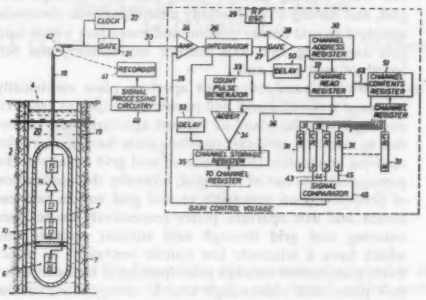
3,939,343

PULSED NEUTRON LOGGING SYSTEM FOR INELASTIC SCATTERING GAMMA RAYS WITH GAIN COMPENSATION

Ward E. Schultz, and Harry D. Smith, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,593
Int. Cl.² G01V 5/00
U.S. Cl. 250—262 **3 Claims**

1. A method for controlling and linearizing the gain of an inelastic neutron scattering measurement well logging system for the direct detection of hydrocarbon in the pore spaces of earth formations in the vicinity of a well borehole comprising the steps of:
passing a well logging sonde containing a pulsed source of fast neutrons and a gamma ray detector through a well borehole;
repetitively irradiating at a repetition rate greater than at least 4000 bursts/sec. earth formations in the vicinity of the borehole with relatively short duration bursts of fast neutrons and detecting, essentially during said neutron bursts, gamma rays produced by the inelastic scattering of fast neutrons and thermal neutron capture gamma rays produced by the capture of thermal neutrons from previ-



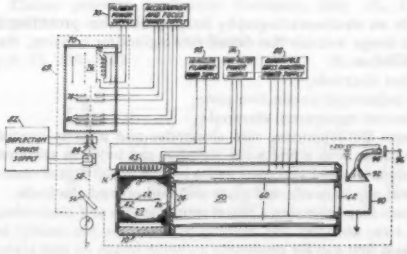
ous bursts at said repetition rate by materials in the vicinity of the borehole;
developing an energy spectrum of gamma radiation emitted essentially only during said neutron irradiating bursts;
developing a gain control signal proportional to the difference in the apparent location in said energy spectrum of gamma radiation attributable to the 2.22 MEV hydrogen capture gamma ray photopeak and its predetermined known location at 2.22 MEV in said spectrum; and
controlling the gain of amplification means used in developing said gamma ray energy spectrum in response to said gain control signal so as to minimize said gain control signal.

3,939,344

PREFILTER-IONIZER APPARATUS FOR USE WITH QUADRUPOLE TYPE SECONDARY-ION MASS SPECTROMETERS

James T. McKinney, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 23, 1974, Ser. No. 535,805
Int. Cl.² H01J 39/34
U.S. Cl. 250—281 **8 Claims**



1. An apparatus for use with a quadrupole type mass analyzer comprising:
an electrically conductive cylindrical grid having entrance and exit ends allowing the axial passage of ions there-

through, positioned in front of the input to the quadrupole mass analyzer such that the longitudinal axis of the grid is in line with the longitudinal axis of the quadrupole analyzer;

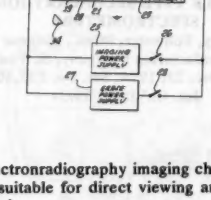
an electrically conductive entrance aperture plate electrically insulated from said grid and positioned adjacent said antrance end thereof such that the plane of the entrance plate is normal to said axis of said grid, said entrance aperture plate having an annular opening concentric to said axis of said grid through which ions may be admitted into said grid, having a solid center portion forming a baffle to prevent ions, neutral atoms, photons and other particles such as may be directed toward said entrance end from passing directly along said axis through said grid, and having a substantially unidimensional electrode attached to said center portion and extending within said grid and along said axis thereof substantially the full length of said grid; and

an electrically conductive exit aperture plate electrically insulated from said grid and positioned adjacent said exit end such that the plane of the exit aperture plate is normal to said axis, said exit aperture plate having a circular opening concentric to said axis of said grid to restrict the passage of ions out of said grid, whereby the application of predetermined potentials to said grid and to said entrance and exit aperture plates respectively causes ions entering said grid through said annular opening and which have a relatively low kinetic energy to be selectively transmitted through said opening in said exit aperture plate, and causes high kinetic energy ions, neutral atoms, photons and other particles not to be transmitted.

3,939,345
LIQUID CRYSTAL IMAGING OF RADIOGRAMS

Frank V. Allan, Los Angeles; John B. Fenn, Jr., Canoga Park, and Murray S. Welkowsky, Sherman Oaks, all of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Filed Dec. 23, 1974, Ser. No. 536,922
Int. Cl.² G03B 41/16
U.S. Cl. 250—315 A 13 Claims



1. In an electronradiography imaging chamber providing a visual image suitable for direct viewing and/or copying, the combination of:

a first electrode;

an anisotropic conductive plate;

a second transparent electrode;

means for supporting said electrodes and plate in spaced relation with a first x-ray absorber gap between said first electrode and said plate and a second liquid crystal material gap between said plate and said second electrode;

means for connecting a power source across said electrodes;

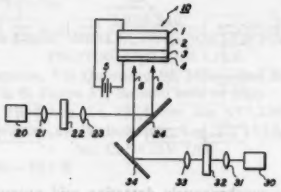
an x-ray absorber and electron and positive ion emitter in said first gap for producing a charge image on said plate; and

a liquid crystal material in said second gap, with said charge image transmitted through said plate towards said second electrode for modulating said material producing a visual image of said charge image.

3,939,346
GAIN PHOTO-CURRENT ENHANCEMENT METHOD

Simpei Tutihashi, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 18, 1974, Ser. No. 507,044
Int. Cl.² H01J 31/49
U.S. Cl. 250—330 30 Claims



1. The method of providing gain photocurrent, comprising:

a. providing between two electrodes, an insulating layer in contact with a photoconductive layer comprising selenium or selenium alloy, the thickness ratio of photoconductive layer to insulating layer being at least about 10 to 1;

b. applying a D.C. voltage across said photoconductive and insulating layers;

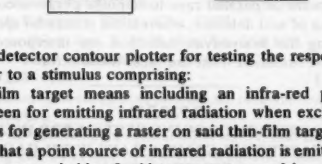
c. impinging said photoconductive layer with light having a wavelength within the fundamental absorption band of the selenium or selenium alloy within said photoconductive layer and which excites a primary current within said photoconductive layer; and

d. impinging said photoconductive layer with infrared radiation.

3,939,347
TWO DIMENSIONAL DISPLAY OF DETECTOR RESPONSE

Gordon A. Shifrin, Malibu, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 5, 1974, Ser. No. 520,991
Int. Cl.² H01J 31/49; G01R 15/12
U.S. Cl. 250—334 15 Claims



1. A detector contour plotter for testing the response of a detector to a stimulus comprising:

thin-film target means including an infra-red phosphor screen for emitting infrared radiation when excited;

means for generating a raster on said thin-film target means so that a point source of infrared radiation is emitted from the opposed side of said target means and is swept over a prescribed area;

focusing means for focusing an image of said raster on the detector under test;

cathode-ray imaging means having a two-dimensional scan which is driven in synchronism with said raster; and

means for applying the output response of the detector under test to said cathode-ray imaging means to control

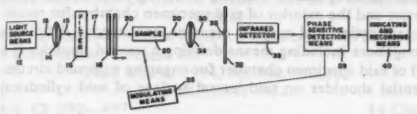
the intensity of its scanning beam in accordance with said detector output response.

3,939,348

INFRARED GAS ANALYSIS

Joseph J. Barrett, Morris Plains, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed June 11, 1974, Ser. No. 478,543
Int. Cl.² G01J 3/28
U.S. Cl. 250—339 14 Claims



11. A method for detecting and quantitatively measuring a molecular species of gaseous material in a sample to be analyzed, comprising the steps of

generating light in the form of incoherent infrared radiation;

collecting, collimating and transmitting the light;

filtering said light so as to selectively transmit light having a frequency range in the region of an absorption band for the molecular species to be detected;

interferometrically filtering said filtered light and transmitting light at a plurality of discrete frequencies to form a plurality of fringes which provide a detectable signal by directing the light through a plurality of transmission windows regularly spaced in frequency, the frequency spacing between adjacent windows being equal substantially to the frequency difference between adjacent spectral lines of the absoprtion spectrum for the molecular species to be detected, and scanning said light to cause the transmission peaks for adjacent orders to coincide substantially with the spectral lines of said absorption spectrum, said signal having an intensity substantially equal to the sum of said fringes;

transmitting said detectable signal through said gaseous material, whereby the intensity of said detectable signal changes in proportion to the concentration of said molecular species; and

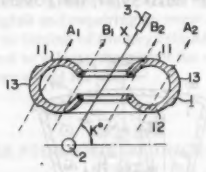
detecting and indicating the intensity change of said signal.

3,939,349

METHOD AND DEVICE FOR CLASSIFYING TIRES

Masami Shimizu, Kawasaki, and Masao Koyama, Hatano, both of Japan, assignors to Fuji Denki Seizo Kabushiki Kaisha and The Yokohama Rubber Company Ltd., both of, Japan

Filed Dec. 26, 1973, Ser. No. 428,014
Claims priority, application Japan, Dec. 27, 1972, 47-585
Int. Cl. G01t 1/16
U.S. Cl. 250—360 5 Claims



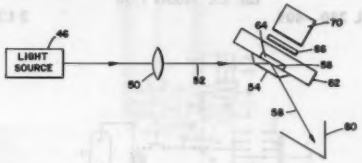
1. A method of classifying a tire which comprises, (a) emitting x-rays and γ-rays from a radiation source on the side of a first sidewall of said tire and irradiated on said tire sidewall at a predetermined angle of inclination relative to the plane of the tire; (b) detecting the intensity of said x-rays or γ-rays which have penetrated through said tire on the side of a second sidewall of said tire, and (c) comparing with each other the values of intensity of said x-rays or γ-rays which have penetrated separately through said first sidewall and said second sidewall thereby to determine whether said tire is a tire with a white ribbon or said tire is a tire without a white ribbon in a sidewall thereof.

3,939,350

FLUORESCENT IMMUNOASSAY EMPLOYING TOTAL REFLECTION FOR ACTIVATION

Melvyn N. Kronick, and William A. Little, both of Palo Alto, Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 29, 1974, Ser. No. 465,009
Int. Cl.² G01T 1/20
U.S. Cl. 250—365 15 Claims



1. A method for determining the presence of a ligand in an unknown suspected of containing said ligand, which comprises:

combining in an aqueous assay medium, said unknown and receptor for said ligand, said receptor having at least on the average one fluorescing molecule bound to each receptor molecule;

contacting said assay medium with one side of an optically transparent surface having a plurality of ligand analogs bound to said surface in contact with said assay medium, wherein the optically transparent surface has a refractive index greater than the refractive index of said assay medium;

irradiating said surface with light having a wave length absorbed by said fluorescing molecule, on the side of said surface opposite said assay medium, and at an angle to said surface to provide total internal reflection; and

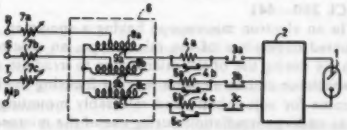
measuring the amount of fluorescent light emitted from said surface, wherein the amount of fluorescent light is a function of the amount of ligand present in said assay medium.

3,939,351

THREE-PHASE X-RAY GENERATOR

Heinz Mester, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 15, 1974, Ser. No. 488,394
Claims priority, application Germany, July 19, 1973, 2336780
Int. Cl.² H05G 1/30
U.S. Cl. 250—402 2 Claims



1. Circuit means for reducing ripple at double mains frequency in the high voltage of an X-ray tube, said ripple resulting from variations in emission current due to temperature variations of the filament of said tube when the filament current is alternating current of mains frequency, said circuit

means comprising a three-phase transformer and rectifier circuit means connected to an X-ray tube for converting three-phase mains voltages into an unsmoothed high voltage for the X-ray tube and unbalancing means for inducing a ripple on said high voltage at double mains frequency so as to cancel the ripple induced by the temperature variations of the filament.

3,939,352

X-RAY GENERATOR PROVIDED WITH STARTING LOAD CONTROL

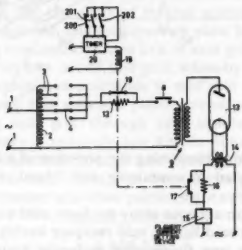
Heinz Mester, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1974, Ser. No. 440,718

Claims priority, application Germany, Feb. 22, 1973, 2308681

Int. Cl.² H05G 1/30

U.S. Cl. 250—409 **3 Claims**



1. An X-ray generator circuit for an X-ray tube, comprising means for starting the X-ray tube at any selected one of a plurality of different starting powers, all of which are higher than the maximum continuous power at which the X-ray tube may to operated, the load capacity of the X-ray tube limiting to different respective time intervals the maximum period during which the tube should be operated at said different starting powers; timing means for measuring said different respective time intervals; and switching means responsive to said timing means for automatically reducing the power of the X-ray tube to a suitably lower power when the X-ray tube has been operated at the selected starting power for the time interval associated with the selected starting power.

3,939,353

ELECTRON MICROSCOPE SPECIMEN MOUNTING APPARATUS

Shogo Shirai, Yokohama, and Haruo Uchida, Machida, both of Japan, assignors to Kabushiki Kaisha Akashi Seisakusho, Japan

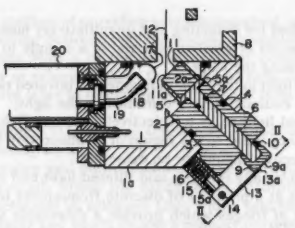
Continuation of Ser. No. 501,802, Aug. 29, 1974, abandoned, which is a continuation of Ser. No. 361,181, May 17, 1973, abandoned. This application Apr. 9, 1975, Ser. No. 566,347

Claims priority, application Japan, May 22, 1972, 47-50588

Int. Cl.² G21K 5/06

U.S. Cl. 250—441 **7 Claims**

1. In an electron microscope having a specimen chamber evacuated during use of the microscope, an electron beam operative during use of the microscope to irradiate a portion of a specimen and an electron lens for focusing the beam, an apparatus for adjustability and releasably mounting a specimen to undergo irradiation during use of the microscope and for substantially reducing the effect of vibration on the focusing of the beam, said apparatus comprising: specimen-holding means positionable into an irradiating position wherein a portion of the specimen is exposed to the electron beam and including means for adjustably positioning the specimen when said specimen-holding means is in said irradiating position to variably select the portion of the specimen exposed to the electron beam, means for releasably mounting said specimen-holding means in said irradiating position, and means for rigidly releasably coupling said specimen-holding means to the electron lens when said specimen-holding means is in said irradiating position, said means for releasably mounting said specimen-holding means comprising, a cylindrical support member having a pair of opposed end surfaces and a lateral surface, means mounting said specimen-holding means at one of said end surfaces, means defining a circumferential shoulder on a portion of said lateral surface, and means defining an annular recess in said lateral surface circumferentially of said lateral surface, means defining a throughbore between the interior and the exterior of said specimen chamber for receiving said cylindrical support member, said means defining a throughbore including means defining a second shoulder in a wall of said specimen chamber for engaging with said circumferential shoulder on said lateral surface of said cylindrical



support member when said cylindrical support member is disposed within said throughbore, and means disposed within said annular recess hermetically sealing said cylindrical support member in said throughbore, said cylindrical support member having one of said opposed end surfaces exposed to the interior and exterior of said specimen chamber respectively whereby said cylindrical support member is forced toward the interior of said specimen chamber whenever a pressure differential is developed between the interior and the exterior of said specimen chamber to engage said shoulders for rigidly releasably coupling said specimen-holding means by said cylindrical support member to the electron lens to transmit vibratory motion from said specimen-holding means to the lens to substantially prevent the relative movement of one with respect to the other whenever said specimen-holding means is induced to vibrate thereby maintaining the focus of the electron beam on the selected portion of the specimen.

3,939,354

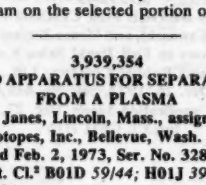
METHOD AND APPARATUS FOR SEPARATION OF IONS FROM A PLASMA

George Sargent Janes, Lincoln, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Feb. 2, 1973, Ser. No. 328,954

Int. Cl.² B01D 59/44; H01J 39/34

U.S. Cl. 250—484 **26 Claims**



1. A method for separating particles of a first charge type from a neutral, bounded environment containing at least particles having a second charge type and wherein said parti-

cles of said first and second charge type have different mass-to-charge ratios, said method including the steps of:

circulating the second charge type particles in said environment on paths which generally close within the bounded environment; and

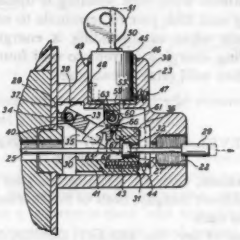
accelerating said particles of said first charge type toward a collection surface in a direction distinct from the circulation of said second charge type particles.

3,939,355

AUTOMATIC LOCKING RADIOISOTOPE CAMERA LOCK

Peter J. Rosauer, Mount Prospect, Ill., assignor to Magnaflux Corporation, Chicago, Ill.

Filed Oct. 4, 1974, Ser. No. 512,063
Int. Cl.² G21F *5/02*
U.S. Cl. 250—497 **14 Claims**



1. In a lock assembly for securing an isotope source in a radioisotope camera shield,

a pigtail extending from said source and adapted to extend and withdraw the isotope source relative to the camera shield,

a hollow lock casing adapted to be secured to the radioisotope camera shield and having a longitudinal lock chamber opening to the camera shield, and a lock barrel chamber extending at right angles with respect to said lock casing,

a stop on the source pigtail,

a lock barrel in said barrel chamber, and biased in an extended position relative to said lock barrel chamber,

a key cylinder in said lock barrel,

means operable by turning movement of said key cylinder to hold said lock barrel in a retracted position relative to said chamber or release said lock barrel to be extended from said chamber, and

three cooperating movable elements for locking and releasing said stop, two being operated by turning of the key cylinder and retracted or extended movement of the lock barrel and the third being operated by withdrawal tension on the pigtail and requiring an overt act on the pigtail in addition to turning of the key cylinder and release of the lock barrel to release the pigtail for extension outside of the camera shield for use.

3,939,356

HYDRO-AIR STORAGE ELECTRICAL GENERATION SYSTEM

Edward S. Loane, Reading, Pa., assignor to General Public Utilities Corporation, Reading, Pa.

Filed July 24, 1974, Ser. No. 491,222
Int. Cl.² F03B *13/105*
U.S. Cl. 290—52 **10 Claims**

1. A hydro-air storage system for generating electricity comprising:

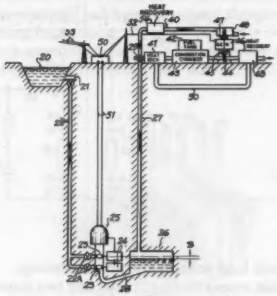
a surface reservoir containing water;

a subterranean hydroelectric power plant;

a penstock connecting said surface reservoir with said hydroelectric power plant;

a subterranean reservoir having an upper region containing compressed air and a lower region containing water;

a conduit connecting the lower water containing region of said subterranean reservoir with said hydroelectric power plant;



a surface power plant for generating electrical power from compressed air; and

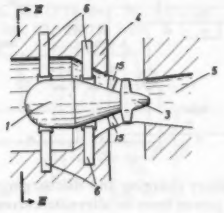
an air shaft connecting the upper compressed air region of said subterranean reservoir with said surface power plant, whereby water from the surface reservoir flows through the subterranean power plant to generate electricity and compressed air is forced through the surface power plant by the water to generate electricity.

3,939,357

POWER PLANT

Gerhard Ziegler, Graz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Oct. 29, 1973, Ser. No. 410,497
Claims priority, application Austria, Nov. 3, 1972, 9370/72
Int. Cl.² H02K *7/18*
U.S. Cl. 290—52 **6 Claims**



1. In a power plant which comprises

(1) a carrying structure having a wall defining a duct having an axis,

(2) a central structure comprising an axial-flow turbine and a generator,

(a) the central structure being disposed substantially coaxially in the duct, and

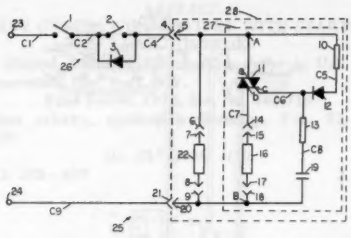
(3) a pair of radial arms rigidly fixed to the wall and extending diametrically and substantially perpendicularly to the axis, on a horizontal plane, the improvement of

(4) hinge means connecting each of the arms to the central structure for pivoting the central structure about an axis substantially parallel to the axis of the duct.

3,939,358
PLURAL LOAD LIGHTING ASSEMBLY ENERGIZABLE THROUGH TWO INPUT TERMINALS

James A. Saveker, 1801 W. 40th St., Lorain, Ohio 44053

Filed Nov. 7, 1974, Ser. No. 521,797
Int. Cl.² H02J 3/02
U.S. Cl. 307—22 7 Claims



1. A plural load control system comprising:

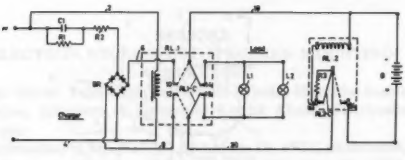
first circuit means further connecting two input terminals to a pair of loads and further having internal means for selectively energizing first load only of said pair of loads with D-C electrical energy when D-C electrical energy of a required polarity characteristic is present across said two input terminals and for energizing said pair of loads with A-C electrical energy when A-C electrical energy is present across said two input terminals; and

source means for connecting electrical energy through said two input terminals, including second circuit means actuable to supply D-C electrical energy of said required polarity characteristic and actuable to supply A-C electrical energy.

3,939,359
BATTERY CHARGING AND DISCHARGING SYSTEM

Jacob Nehushtan, and Meyer Schusberger, both of Rishon-le-Zion, Israel, assignors to Tadiran Israel Electronics Industries Ltd., Israel

Filed Aug. 16, 1974, Ser. No. 497,888
Int. Cl.² H02J 7/00
U.S. Cl. 307—66 3 Claims



1. A battery charging and discharging system for normally supplying power from an alternate current source as charging power to a battery, for disconnecting the battery from the source and connecting the battery to a load when said source power fails and the battery current exceeds a preselected value, and to disconnect the battery both from source and from said load when said source power fails and the battery current fails to said value, said system comprising:

a first pair of terminals adapted for connection to said source;

a second pair of terminals adapted for connection to said load;

a third pair of terminals adapted for connection to the battery;

fourth and fifth pairs of terminals, one of the fifth pair of terminals being connected to one of the third pair of terminals;

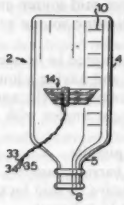
a device connected between the interconnected terminals of the third and fifth pairs and the others of said third and fifth pair terminals to interconnect the said other terminals and supply charging current to said battery when charging current is supplied to the fifth pair of terminals, to interconnect the said other terminals and cause the battery to supply current to said fifth pair of terminals when said charging current is absent and said battery current exceeds said value, and to disconnect said other terminals from each other and prevent battery current from being supplied to said fifth pair of terminals when charging current is absent from the fifth pair of terminals and said battery current is absent; and

a battery charging circuit connected between said first and fourth pairs of terminals, said circuit including a first relay having a winding which is energized when said source supplies power and deenergized when source power fails, said first relay having first contact means connecting said fifth pair of terminals to said second pair of terminals when said winding is deenergized and connecting said fifth pair of terminals to said fourth pair of terminals when said winding is energized, said circuit delivering charging current to said fourth pair of terminals when said relay is energized.

3,939,360
LIQUID LEVEL SENSOR AND ELECTRODE ASSEMBLY THEREFOR

John A. Jackson, Oshawa, Canada, assignor to John A. Jackson and Albert Bangay, both of Scarborough, Canada, part interest to each

Continuation of Ser. No. 409,631, Oct. 25, 1973, abandoned. This application Jan. 22, 1975, Ser. No. 543,193
Int. Cl.² H01H 35/18
U.S. Cl. 307—118 15 Claims



1. Apparatus for detecting the level of fluid in a non-conducting container and comprising:

a. detector means mountable against the exterior surface of said container and having three spaced capacitance plate members, namely an upper member, a lower member and a middle member between said upper and lower members, the capacity between said upper and middle members being C_1, the capacity between said lower and middle members being C_2, and the value of C_1 being greater than that of C_2 when said detector means is located in air and also when said detector means is mounted on said container with the fluid level in said container above or below said detector means,

b. circuit means including a bias capacitance of capacity C_3 detachably connected between said lower and middle members, the value of C_2 being such that when said detector means is located in air or on said container with the fluid level in said container below said upper member, the value of C_1 is less than the combined values of C_2 and C_3, and when said detector means is on said container with the fluid level in said container above said upper member, C_1 is greater than the combined values of C_2 and C_3,

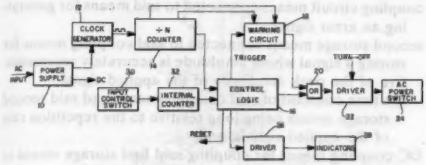
c. said circuit means including means for comparing the value of C_1 with the combined values of C_2 and C_3 and

operative to produce an alarm signal when the value of C_1 is less than the combined values of C_2 and C_3.

3,939,361
ELECTRONIC TIMER SWITCH

Dwain Aidala, Marlboro, and Albert W. Welz, Jr., Westford, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed May 9, 1974, Ser. No. 468,474
Int. Cl.[2] H01H 7/00, 43/00
U.S. Cl. 307—141 **6 Claims**



1. A timer switch adapted for electrical connection to an alternating current source and comprising:

a manually actuable input control switch;

first electronic circuit means operative in response to alternating current from said source to provide a count representative of the number of alternating current cycles received from a reference time, and including

clock means operative to provide clock pulses in response to and at the frequency of said alternating current; and

counter means operative in response to said clock pulses to provide a first signal upon receipt of a predetermined number thereof;

control circuit means for providing a timing interval for duration selectable in successive discrete increments in response to the number of manual actuations of said control switch and including

interval counter means operative in response to each actuation of said control switch to provide a second signal of duration corresponding to a discrete increment;

second electronic circuit means operative in response to said first signal from said counter means and said second signal from said interval counter means to provide an output signal for the duration of said selected timing interval; and

switch means operative in response to and for the duration of said output signal.

3,939,362
POWER PACK WITH SWITCH FOR PLURAL PRIMARY-ECONDARY CONNECTIONS

James E. Grimes, and Joseph W. Rovan, both of Anaheim, Calif., assignors to Disston, Inc., Pittsburgh, Pa.

Filed Dec. 5, 1974, Ser. No. 529,630
Int. Cl.[2] H02J 4/00
U.S. Cl. 307—150 **6 Claims**

1. In a power pack for use with small electrical appliances to provide an operating voltage from a line voltage, comprising:

a. a case and cover assembly for housing a transformer core and winding subassembly;

b. a transformer subassembly in the housing including:

1. a bobbin molded of electrical insulating material and formed with a plurality of isolated cavities adapted for receiving and mounting soldering lugs, primary terminals and a switch assembly and formed with the other integral insulating formations for receiving and insulating the core from the windings;

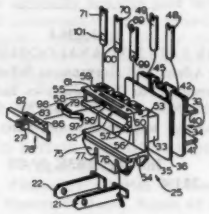
2. primary and secondary windings wound on the bobbin;

3. primary and secondary soldering lugs secured in respective ones of said cavities and connected to selected taps on the windings;

4. primary terminals secured to the bobbin in other respective said cavities and connected to the primary winding, said primary terminals projecting from the cover for engaging a wall outlet to connect to the line voltage;

5. a laminated core secured to the bobbin and surrounding the windings and being insulated therefrom by said insulating formations;

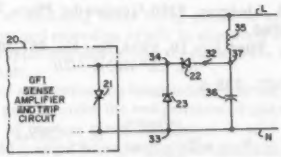
6. a switch assembly mounted and retained in said switch assembly cavity formed in the bobbin, said switch assembly including a movable switch member with an operator member extending through and operable externally of said case and cover assembly with an electrically conducting contactor member operative in one position to electrically connect a tap on one side of said windings with a first circuit configuration on that side and with said operator member in an opposite position being operative to electrically connect a tap on the same side into a second circuit configuration on that side, said circuit configurations being operative in conjunction with said core, windings and the circuit configuration of the opposite side to provide a particular character of supply voltage for each said position.



3,939,363
CIRCUITRY WITH ZENER DIODE VOLTAGE SURGE SUPPRESSOR CONNECTED TO SERVE AS HALF WAVE RECTIFIER

Joseph C. Engel, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1974, Ser. No. 445,524
Int. Cl.[2] H07H 7/20
U.S. Cl. 307—202 R **5 Claims**



1. Electrical apparatus comprising:

a first circuit portion requiring a half wave rectified voltage source and including an element to be protected from surge voltages beyond a predetermined value;

a three terminal diode arrangement interconnected with the first circuit portion, the diode arrangement including a pair of diodes connected in series opposition and having first and second terminals to common electrodes of said diodes that are not connected to each other and a third terminal at the other pair of common diode electrodes that are connected to each other with the first and second

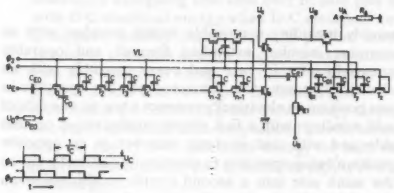
terminals available for connection to a full wave alternating voltage source and the second and third terminals connected across the element to be protected, at least said diode between said second and third terminals having rectification and voltage dependent conduction characteristics;

said first circuit portion being a sense amplifier and trip circuit of a ground fault interrupter and said first and third terminals of said diode arrangement being connected to conductors of a full wave alternating voltage supply including a neutral conductor connected to the second diode terminal and a hot line conductor connected through a solenoid trip coil to the first diode terminal.

3,939,364
DELAY LINE FOR ANALOGOUS SIGNALS

Fritz Guenter Adam, and Hermannus Schat, both of Freiburg, Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Nov. 12, 1974, Ser. No. 523,187
Claims priority, application Germany, Nov. 21, 1973, 2357982
Int. Cl.² H03K *21/00*
U.S. Cl. 307—221 C **9 Claims**



1. A delay line of the type wherein a plurality of stages are coupled together, said delay line having an input to which there is applied a d.c. potential and a signal to be delayed and wherein clock signals are applied to said stages, comprising:

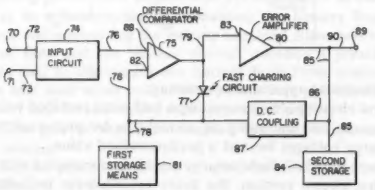
at least one inverter stage coupled between two adjacent stages of said plurality of stages for inverting the signal potential; and

means for adding the output of said at least one inverter stage to said delay line thereby reducing unwanted modulations with respect to said d.c. input potential.

3,939,365
PULSE PEAK DETECTOR

William A. Lindgren, 9300 Gunpowder Place, Gaithersburg, Md. 20760

Filed July 10, 1974, Ser. No. 487,307
Int. Cl.² H03K *5/20*
U.S. Cl. 307—235 A **4 Claims**



1. A pulse peak detector for generating a DC voltage proportional to the peak amplitude of an applied input pulse having a short duration and a fast rise time comprising:

an input circuit for receiving the applied pulse signal;

first storage means connected to said input circuit for storing a signal related to the peak amplitude of the applied pulse signal,

said first storage means and said input circuit having a time constant less than the duration of the applied pulse;

means connected to said input circuit and to said first storage means for generating an error signal of predetermined amplitude,

the time duration of said error signal being proportional to the time interval during which the amplitude of the applied signal is greater than the amplitude of the signal stored by said first storage means;

coupling circuit means connected to said means for generating an error signal;

second storage means connected to said coupling means for storing a signal whose amplitude is accurately representative of the peak amplitude of the applied signal,

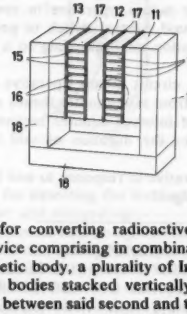
the time constant of said coupling means and said second storage means being long relative to the repetition rate of the applied signals; and

DC coupling means for coupling said first storage means to said second storage means whereby charge is exchanged between said second storage means and said first storage means.

3,939,366
METHOD OF CONVERTING RADIOACTIVE ENERGY TO ELECTRIC ENERGY AND DEVICE FOR PERFORMING THE SAME

Yasuro Ato, and Soji Miyagawa, both of Nagoya, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation of Ser. No. 227,545, Feb. 18, 1972, abandoned. This application Oct. 9, 1973, Ser. No. 404,425
Claims priority, application Japan, Feb. 19, 1971, 46-8144
Int. Cl.² G21D *7/00*
U.S. Cl. 310—3 R **1 Claim**



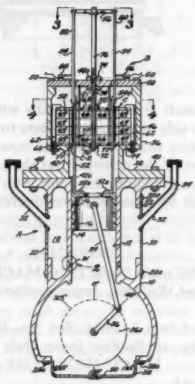
1. A device for converting radioactive energy to electric energy, said device comprising in combination, a first, second and third magnetic body, a plurality of InSb monocrystalline semi-conductor bodies stacked vertically between said first and second and between said second and third magnetic body, each stacked plurality of semi-conductor bodies being separated from the magnetic body by an insulating plate, a layer of ^{210}Po radioactive substance sandwiched between adjacent semi-conductor bodies and disposed to produce electron hole pairs in said semi-conductor bodies, wherein said electron hole pairs diffuse toward an unirradiated region of said semiconductor bodies to eleminate the differences in density between electrons and holes in each of said semiconductor bodies, said magnetic bodies separating said electrons and said holes from each other by means of the resultant magnetic field wherein said electrons and holes are caused to move in a direction perpendicular to the direction of diffusion of the electron-hole pairs, and a U-shaped plate member of high magnetic permeability disposed by the leg members thereof on the outer surfaces of said first and third magnetic bodies, said U-shaped plate member supporting the magnetic bodies and said stacked semi-conductor bodies in association, each of

said semi-conductor bodies having electrodes on opposite sides thereof to receive separated electron-hole pairs of electric energy generated within each of the semi-conductor bodies.

3,939,367
MAGNETICALLY ACTUATED RECIPROCATING ENGINE

Juan A. Ramirez, 513 E. 224th St., Carson, Calif.

Filed Aug. 4, 1975, Ser. No. 603,027
Int. Cl.² H02K 7/06
U.S. Cl. 310—20 6 Claims



1. In combination with a crankshaft, a flywheel connected to said crankshaft, a connecting rod pivotally connected to said crankshaft, a piston pivotally connected to said connecting rod, an engine block that rotatably supports said crankshaft and flywheel, said engine block having a cylinder therein in which said piston reciprocates when said crankshaft and flywheel rotate, a source of electric energy, a magnetically actuated device for driving said crankshaft, said device including:

a. a housing mounted on said block, with the interior of said housing in communication with said cylinder;

b. first and second permanent magnetic means situated in said housing that define an annulus shaped space therebetween that has a magnetic field therein, with the adjacent portions of said first and second magnetic means of the same polarity, and said annulus shaped space axially aligned with said cylinder;

c. a solenoid coil that may reciprocate in said annulus shaped space to positions thereabove and below, said solenoid coil having a first end that first enters said annulus shaped space when said solenoid coil moves downwardly relative thereto and a second end that first enters said annulus shaped space when said solenoid coil moves upwardly relative to said annulus shaped space;

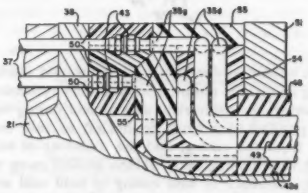
d. first means that supports said solenoid coil at a fixed position relative to said piston; and

e. commutation means for intermittently completing an electric circuit to said solenoid from said source of energy and reversing the direction of flow of current through said solenoid, said commutation means as said crankshaft and flywheel rotate to dispose said second end of said solenoid in a position to move into said annulus shaped space completing an electric circuit from said source of electric energy to said solenoid coil that imparts a magnetic polarity to said second end such that said solenoid tends to be pulled downwardly towards a locked position in said annulus shaped space, said commutation means just prior to said solenoid coil moving to said locked position breaking said electric circuit, said solenoid coil after said electric circuit has been broken continuing to move downwardly in said annulus shaped space due to momentum imparted to said flywheel, said solenoid coil after said first end thereof has moved downwardly in said annulus shaped space below the center of said magnetic field having said electric circuit thereto again completed to energize said solenoid coil for said first end thereof to have a polarity that tends to force said solenoid coil downwardly out of said annulus shaped space, said electric circuit to said solenoid coil being broken by said commutation means when said first end of said solenoid coil has moved downwardly out of said annulus shaped space, with the momentum imparted to said flywheel causing said crankshaft to rotate until said solenoid coil starts to move upwardly towards said annulus shaped space, and said commutation means intermittently completing said electric circuit in reverse order and with reverse current flow as said solenoid moves upwardly through said annulus shaped space.

3,939,368
LIQUID-COOLED ROTOR FOR DYNAMOELECTRIC MACHINES

Jacques E. Albaric, Pittsburgh; Charles W. Burkhart, North Huntingdon, and Warren W. Jones, Acme, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 25, 1974, Ser. No. 482,912
Int. Cl.² H02K 9/00
U.S. Cl. 310—59 5 Claims



1. A rotor for a dynamoelectric machine comprising:

a shaft portion having an axis extending therethrough and a body portion carrying windings, said windings including conductors having passages for circulation of a liquid coolant therethrough,

an annular coolant chamber encircling said shaft portion,

means for supplying liquid coolant to said chamber,

a plurality of connectors disposed in radially-spaced circular rows extending circumferentially in one wall of the chamber,

a plurality of insulating hoses being joined to each of said connectors and extending axially in alignment therewith,

means for supporting said connectors and hoses in position on the shaft,

a plurality of slots extending longitudinally in the surface of the shaft portion under the end portions of said windings,

a plurality of coolant tubes connected to said insulating hoses, said coolant tubes having axial portions extending axially from said hoses through a transition region, said tubes being disposed in a predetermined arrangement in said transition region to bring them into groups at a smaller radial distance from the shaft axis than said hoses, each group of tubes extending axially in one of said slots for connection of the tubes to the winding conductors, and

means in said transition region for isolating said coolant tubes into sets of tubes and for rigidly supporting in position said tubes in each set, said isolating and supporting means comprising;

wall members extending radially in said transition region between said coolant tubes to isolate said tubes into

said sets, said walls defining spaces containing said tubes within each set therebetween, and,

a mass of resin surrounding and enclosing each set of tubes in said spaces between said wall members,

blocks of rigid insulating material enclosing and supporting said axially extending portions of said tubes between said mass of resin and said insulating hoses, and,

rigid insulating blocks supporting said axially extending groups of tubes in said slots, said masses of resin being confined between said walls and said insulating blocks on both sides thereof.

3,939,369

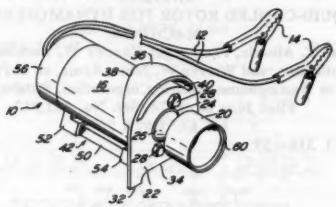
HOUSING FOR STARTER MOTOR

Matthew A. Sullivan, Elkins Park, Pa., assignor to Sullivan Products, Inc., Willow Grove, Pa.

Filed July 17, 1974, Ser. No. 489,318

Int. Cl.² H02K *5/00*

U.S. Cl. 310—89 **15 Claims**



1. In an apparatus for housing a hand-held starter motor comprising an electric motor, a substantially cylindrical casing for said motor, the cylindrical axis of said casing being substantially parallel to a shaft connected to said motor and extending from the casing, and the diameter of said casing being such that the hand may extend around more than 180° of the circumference of said casing to hold said motor, the improvement comprising flange means adjacent the end of said casing where said shaft extends from said casing, said flange means extending radially outwardly beyond the circumference of said casing along substantially 360° of said circumference, the radial extent of said flange means being sufficient to prevent the user's hand and fingers from sliding past said flange means, said flange means having a curved surface, said curved surface circumscribing a portion of the outer surface of said casing and facing away from the end of said casing from which said shaft extends, said curved surface approximately fitting the curve of the hand between the thumb and the forefinger when the hand is holding said motor.

3,939,370

VARIABLE SPEED THREE-PHASE MOTOR

Arnold Müller, Lichtensteinstrasse 31, 7312 Kirchheim, Teck, Germany

Filed June 18, 1974, Ser. No. 480,426

Claims priority, application Germany, June 28, 1973, 2332868

Int. Cl.² H02K *17/16*

U.S. Cl. 310—125 **3 Claims**

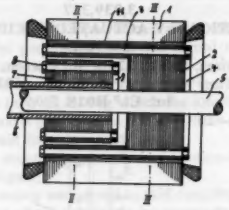
1. A variable speed three-phase short-circuit motor comprising:

a central drive output shaft defining the longitudinal axis of the motor;

a main rotor of the short-circuit cage type, fixedly mounted on the output shaft for rotation therewith;

a hollow intermediate rotor axially adjoining the main rotor as an extension of its short-circuit cage, thereby forming a continuous outer rotor surface therewith, the intermediate rotor being thus solidary with the main rotor and disposed coaxially with respect to the output shaft to form a cavity that is concentric with respect to the motor axis;

an inner short-circuit rotor arranged inside said cavity so as to cooperate with the surrounding intermediate rotor;



a secondary shaft arranged coaxially with the drive output shaft on the side of the intermediate rotor and inner rotor, said secondary shaft carrying the inner rotor for rotation independent of the drive output shaft; and

a stator surrounding both the main rotor and the intermediate rotor for dynamoelectric cooperation therewith.

3,939,371

ROTARY ELECTRIC MACHINE

Tadao Murakami, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed July 2, 1974, Ser. No. 485,253

Claims priority, application Japan, July 4, 1973, 48-74794

Int. Cl.² H02K *21/28*

U.S. Cl. 310—154 **8 Claims**

1. In a rotary electric machine comprising a rotor, a stator, and at least a pair of magnetic poles associated with one of said rotor and stator, each of said pair of magnetic poles including at least one magnet having different B-H characteristics along the direction of rotation of said rotor, said magnet including a portion having the highest coercive force where the magnetic field is weakened and a portion having the highest magnetic flux density where the magnetic field is strengthened, the improvement comprising said magnet including intermediate portions where the magnetic flux density and the coercive force are progressively substantially increased and decreased respectively.

3,939,372

CONTACT-FREE PULSE GENERATORS

John W. Wurst, Dover, and James E. O'Brien, Kenilworth, both of N.J., assignors to The Singer Company, New York, N.Y.

Continuation of Ser. No. 364,836, May 29, 1973, abandoned. This application Nov. 7, 1974, Ser. No. 521,712

Int. Cl.² H02K *19/24*

U.S. Cl. 310—168 **1 Claim**

1. A contact-free electrical pulse generator, comprising;

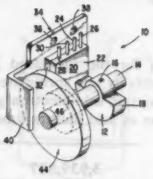
a. a flux conducting base member

b. permanent magnet means adapted to be affixed to said base member for providing a source of flux lines;

c. a Hall effect sensor device adapted to be mounted juxtaposition said magnet means and within the path of said flux lines, said sensor device having at least two stable states depending on the level of flux density imposed thereon;

d. a flux conducting rotary shaft means adapted to be journaled in spaced relation to said base member and adapted to cooperate with said base member to enhance the flow of said flux lines;

e. flux conducting cam means adapted to be carried by said rotatable shaft in a position to cooperate with said Hall sensor device in said flux path, said cam means having a



stepped peripheral circumference for changing the magnetic flux density imposed by said magnet means on said Hall sensor device in accordance with preselected angular positions of said rotary shaft means;

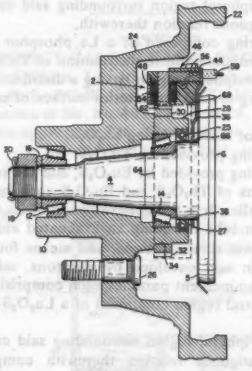
f. said base member including a portion at one end extending outwardly therefrom toward said rotary shaft means and said rotary shaft means in addition to said flux conducting cam means including a circular shaped flux conducting disc carried thereon and adapted to rotate in overlapped relation proximate said outwardly extending base member portion to provide a magnetic flux conducting circuit with the base member through the circular disc, the shaft, and the cam means.

3,939,373

FIXED GAP SPEED SENSOR

James K. Roberts, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Oct. 29, 1974, Ser. No. 518,668
Int. Cl.² H02K *19/20*
U.S. Cl. 310—168 **1 Claim**



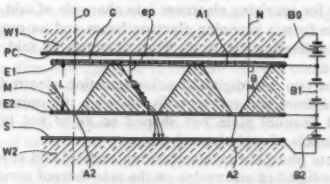
1. A device for sensing the speed of a wheel having a hub rotating on a spindle, comprising a tone wheel including a ring shaped member mounted on the wheel hub, the member being made of magnetic material with teeth formed in the outer periphery and the inner surface of the ring shaped member engaging a portion of the wheel hub which is concentric with the hub axis, a pick-up for sensing the speed of rotation of the tone wheel and providing signals corresponding thereto, a bracket having a nest for receiving the pick-up and having a locating aperture for mounting the bracket on a hub seal surface on the spindle, the pick-up being potted in the nest with a potting compound in a position to provide a suitable gap between the tone wheel and pick-up to avoid adjustment of the pick-up relative to the tone wheel after assembly of the bracket to the spindle, the pick-up being accurately positioned in the nest during potting by clamping the pick-up to a surface of a stepped plug having a radius corresponding to the radius of the tone wheel plus a suitable gap between the tone wheel and pick-up while the locating aperture in the bracket is closely mated on a diameter on the stepped plug.

3,939,374

ELECTRON MULTIPLIERS HAVING TAPERED CHANNELS

Pieter Schagen; Hewson Nicholas Graham King; Daphne Louise Lamport; Roger Pook; Pamela May Stubberfield, and Derek Washington, all of Salfords, near Redhill, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,016
Claims priority, application United Kingdom, Nov. 6, 1973, 2842/73
Int. Cl.² H01J *43/24, 43/22*
U.S. Cl. 313—95 **9 Claims**



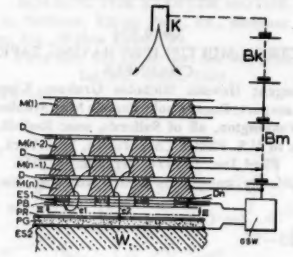
1. A channel plate electron multiplier, comprising a thin plate having two major faces and a plurality of closely spaced substantially identical channels interconnecting said two major faces, the axes of said channels being parallel to each other and a major part of each of said channels having a cross-section which is gradually tapered from an input aperture of one cross-section to an exit aperture of smaller cross-section, the ratio of the cross-sectional area of said input aperture to the cross-sectional area of said exit aperture being no less than five, the ratio between the axial distance spacing said input aperture from said exit aperture to the smallest linear dimension of said input aperture being no greater than three, the surfaces of said channels being resistive and secondary emissive at leas over said gradually tapered major part, and an electrostatic field controlling conductive structure adjacent to and extending across said input aperture for flattening any fringing electrostatic field generated within said channels to the extent that substantially all equipotential surfaces within said channels intersect with the surfaces of said tapered major part at an angle not less than fifty degrees nor greater than seventy-five degrees, in order that a major portion of secondary emitted electrons are thereby attracted back toward and collide with the secondary emissive surface of said tapered major part at a point closer to said exit aperture without crossing to and colliding with the opposite side of said tapered major part.

3,939,375

CATHODE RAY TUBE HAVING CHANNEL MULTIPLIER AND ELECTRON REFLECTING SYSTEM FOR ENERGIZING COLOR PHOSPHOR STRIPS

Pieter Schagen; Hewson Nicholas Graham King, and Derek Washington, all of Salfords, near Redhill, England, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 288,597, Sept. 13, 1972, Pat. No. 3,860,849. This application Dec. 3, 1974, Ser. No. 529,263
Claims priority, application United Kingdom, Aug. 8, 1972, 42723/72
Int. Cl.² H01J 29/07, 29/28
U.S. Cl. 313—408 7 Claims



1. An image display screen for use in a color television tube, comprising:

a channel plate defining a display area and having an input side for receiving electrons into channels of said channel plate from a scanning electron beam and an output side for delivering electrons from channels of said channel plate;

at least two interdigitated color selection electrodes insulated from and substantially covering the output side of said channel plate but shaped so as to not block the channels of said channel plate;

separate phosphor layers covering each of said at least two interdigitated electrodes on the side thereof remote from said channel plate; said separate phosphor layers corresponding to different colors; and

a further electrode coextensive with said channel plate and spaced from and facing said separate phosphor layers, whereby electrons delivered from a channel of said channel plate may be directed toward and be caused to collide with the phosphor layer covering a selected one of said electrodes in the vicinity of said channel by application of appropriate electrical potentials to said electrodes.

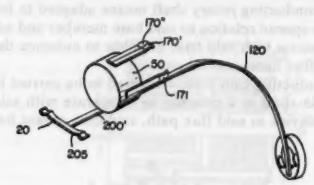
3,939,376

ALIGNMENT SPRING COUNTERACTING ANTENNA TYPE GETTER EFFECT ON ELECTRON GUN ALIGNMENT

Clair W. Reash, Fairview Park, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 26, 1974, Ser. No. 536,619
Int. Cl.² H01J 29/02, 29/70, 29/82
U.S. Cl. 313—451 1 Claim

1. In a picture tube having a cylindrical neck portion and a conical funnel portion and containing an electron gun assembly including a glass header member adapted to seal the neck portion, a cylindrical metal cup member said cup member being held centrally spaced in said neck portion by peripherally attached spring members, a getter assembly attached to said cup member by an elongated spring member which forcibly holds said getter assembly against the funnel portion of said tube and imparts a rotational force on said electron gun assembly, the improvement which comprises at least one spring member attached to said cup member and extending toward said header member and forcibly contacting said neck portion of said picture tube and imparting a force on said electron gun assembly which substantially balances said rotational force due to said elongated spring member attached to said getter assembly, said peripherally attached spring members compensating for the increased force applied to the electron gun assembly by said spring member attached to said cup member to maintain said electron gun in axial alignment in said neck portion of said picture tube.

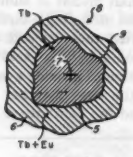


3,939,377

PENETRATION PHOSPHORS AND DISPLAY DEVICES

Stanley F. Ignasiak, Marlboro, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 13, 1974, Ser. No. 505,710
Int. Cl.² H01J 31/20
U.S. Cl. 313—468 20 Claims



1. An electron tube including an evacuated envelope, a cathodo-luminescent screen therein, and means for exciting said screen within said envelope by electrons, said screen including cathodo-luminescent particles each comprising:

a generally central region, and

a generally peripheral region surrounding said central region in contiguous relation therewith,

said particle being composed of a La phosphor material with a substantially uniform distribution of Tb ions, and

said generally peripheral region having a distribution of Eu ions increasing toward the exterior surface of said particle,

said La phosphor material being La_2O_2S,

said Tb ions being provided by Tb_2O_2S,

said Eu ions being provided by Eu_2O_2S, and the respective concentrations of Tb_2O_2S and Eu_2O_2S each being substantially smaller than the concentration of La_2O_2S.

16. An electron tube including an evacuated envelope, a cathodo-luminescent screen therein, and means for exciting said screen within said envelope by electrons, said screen having cathodo-luminescent particles each comprising:

a generally central region composed of a $La_2O_2S : Tb_2O_2S$ phosphor,

a generally peripheral region surrounding said central region in contiguous relation therewith composed of $La_2O_2S : Tb_2O_2S : Eu_2O_2S$ phosphor,

the La_2O_2S and Tb_2O_2S materials being substantially uniformly distributed in said particle and the relative concentrations of said Tb_2O_2S and said Eu_2O_2S being such that relatively low velocity electrons striking any one of said particles excite said phosphor in said peripheral region preferentially to produce red line emission, and relatively high velocity electrons striking one of said

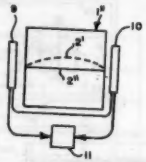
particles excite said phosphor in said central region preferentially to produce green line emission.

3,939,378

STORAGE CATHODE RAY TUBE HAVING AUXILIARY COILS TO CORRECT NON-SYMMETRICAL GEOMETRY

Johnnie Everett Schmauder, Portland, and James Kipling Richardson, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 388,857, Aug. 8, 1973, abandoned.
This application Jan. 8, 1975, Ser. No. 539,563
Int. Cl.[2] H01J 31/60, 31/58
U.S. Cl. 315—12 R 1 Claim



1. A storage cathode-ray-tube having auxiliary coils to correct non-symmetrical geometry of an image caused by electron-electron interaction of writing and storing electron beams, comprising:

faceplate means including a storage target for providing an image producing means;

means for bombarding said faceplate means with high velocity electrons emitted from a single on axis writing electron gun to produce an image on said storage target;

means for simultaneously bombarding said faceplate means with uniformly distributed flood beam electrons emitted from a single off axis flood electron gun to retain said image; and

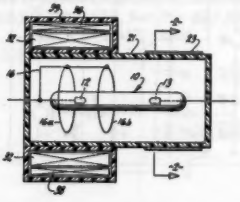
an auxiliary set of "Hemholtz" coils disposed between said faceplate means and said flood electron gun and on opposite sides of the cathode-ray-tube, said coils connected to receive said flood beam electrons for producing a correcting field proportional to said flood beam electrons for compensating the electron-electron interaction thereby substantially eliminating non-symmetrical geometry of the image.

3,939,379

HIGH ENERGY GAS DISCHARGE SWITCHING DEVICE

John W. Sullivan, Los Altos, and Richard P. Fleenor, Los Gatos, both of Calif., assignors to Gould Inc., Chicago, Ill.

Continuation of Ser. No. 483,114, June 26, 1974, abandoned.
This application Feb. 18, 1975, Ser. No. 550,300
Int. Cl.[2] H01J 1/52, 5/02, 11/04
U.S. Cl. 315—85 19 Claims



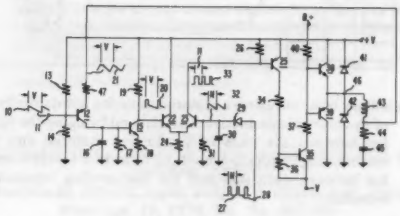
1. In a high energy switching device for delivering energy from a source to a load: a gas discharge tube having first and second electroder connected electrically in series with the source and the load, a control element connected to the first electrode, means for applying a trigger signal to the control element to initiate firing of the tube to pass energy from the source to the load, and means comprising an electrostatic shield disposed about the second electrode for preventing the tube from firing in the absence of a trigger signal when the potential between the electrodes is below a predetermined level.

3,939,380

CLASS D AMPLIFIER

John Charles Peer, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 21, 1974, Ser. No. 444,405
Int. Cl.[2] H01J 29/70, 29/76
U.S. Cl. 315—397 7 Claims



1. A class D amplifier comprising:

first and second serially coupled active current conducting devices;

first and second unidirectional current conducting devices respectively parallelly coupled to said first and second active devices and poled for conducting forward current in a direction opposite to forward current conduction in said first and second active devices;

means coupling the junction of said first and second active devices to the junction of said first and second unidirectional devices for forming an output terminal adapted for supplying current to a load; and

means coupled to control electrodes of said first and second active devices for providing signals for alternately enabling said first and second active devices for conduction such that during a first portion of an amplifying cycle said first active device conducts in the forward direction and said second active device conducts in its reverse direction, and during a second portion of said amplifying cycle said second active device conducts in its forward direction and said first active device conducts in its reverse direction for minimizing crossover distortion in said amplifier.

3,939,381

UNIVERSAL BURN-IN FIXTURE

David P. Meany, Anaheim, Calif., assignor to MCM Industries, Inc., Anaheim, Calif.

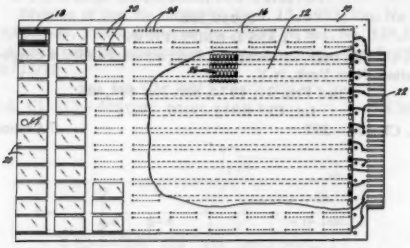
Filed Mar. 22, 1974, Ser. No. 453,858
Int. Cl.[2] H02B 1/04; H01C 1/00; H05K 1/16
U.S. Cl. 317—101 R 15 Claims

1. A universal burn-in fixture for aging a plurality of semiconductor devices at the same time, and wherein the semiconductor devices may be any one of a plurality of types which are enclosed in a standard package having a plurality of leads in predetermined locations, including,

a printed circuit board having a layer of conductive material on at least one side of the board,

the printed circuit board subdivided into a plurality of areas each conforming in size to receive a semiconductor device of standard configuration and with each area containing a plurality of openings conforming in location to the predetermined locations of the plurality of leads for each standard semiconductor package,

the layer of conductive material formed in a conductive pattern of pads of conductive material spaced from and surrounded by the remaining layer of conductive material and with the pads of conductive material surrounding predetermined ones of the openings, and



a unitary layer of resistive material covering substantially all of the layer of conductive material and bridging the spacing between the pads of conductive material and the surrounding conductive material to form a separate resistor between each pad and the surrounding conductive material.

3,939,382

CHASSIS INTENDED TO HOLD ELECTRONIC CIRCUITS

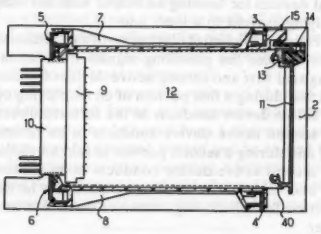
Guy Lacan, Carrieres Sous Bois, and Yves Oehlert, Rueil Malmaison, both of France, assignors to Le Telemecanique Electrique, Nanterre, France

Filed Apr. 5, 1974, Ser. No. 458,147

Claims priority, application France, Apr. 12, 1973, 73.13357

Int. Cl.² H02B 1/02

U.S. Cl. 317—101 DH **4 Claims**



1. A rack for mounting circuit boards comprising: a pair of vertically spaced side walls, a first pair of vertically spaced cross-pieces attached to the respective side walls, a second pair of vertically spaced cross-pieces attached to the respective side walls and extending parallel to said first pair of cross-pieces, said first and second pairs of cross-pieces each having regularly spaced and inwardly facing grooves, said second pair of cross-pieces having inwardly facing extensions, a connector provided with first and second end projecting tongues, each of said projecting tongues being provided with an aperture, a plurality of pairs of support members each extending between the first and second pairs of cross-pieces, said support members being provided with opposed elongated grooves for the reception of circuit card edges and having projecting studs which removably engage the said apertures and shoulders which press the said projecting tongues against the said inwardly facing extensions, said support members further having vertically extending ribs which slidably and horizontally engage the grooves of the cross-pieces of the second pair and resilient jaws which grasp and hold the cross-pieces of the second pair, said support members further having further ribs which slidably and vertically engage the grooves of the cross-pieces of the first pair and further resilient jaws which grasp and hold the cross-pieces of the first pair.

3,939,383

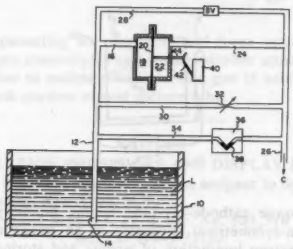
LIQUID LEVEL MONITORING DEVICE

Gerald F. Alm, Grangeville, Idaho, assignor to The Wickes Corporation, San Diego, Calif.

Filed Jan. 31, 1975, Ser. No. 546,010

Int. Cl.² H01H 47/00

U.S. Cl. 317—123 **9 Claims**



1. A liquid level monitoring device comprising flexible pressure responsive diaphragm means, first pressure applying means for applying to one side of said diaphragm means a pressure variable in response to variations of level of a body of liquid being monitored, second pressure applying means for applying a constant pressure to the opposite side of said diaphragm means, first normally closed by-pass valve means operable in an open position to equalize the pressure on the opposite sides of said diaphragm means, second by-pass means connected in parallel with said first by-pass means establishing communication between opposite sides of said diaphragm means, sensitivity adjustment means in said second by-pass means for selectively blocking or adjustably restricting flow through said second by-pass means, and control means responsive to an unequalized pressure on opposite sides of said diaphragm means for opening said first by-pass valve means.

3,939,384

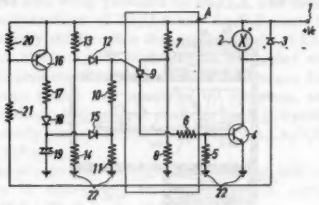
ELECTRIC TIMER SWITCH

Hiroshi Nakayama, Shizuoka, Japan, assignor to Iwatani & Co., Ltd., Osaka, Japan

Filed Oct. 2, 1974, Ser. No. 511,251

Int. Cl.² H03H 9/30

U.S. Cl. 317—141 S **10 Claims**



1. A timing apparatus comprsing:

a a programmable unijunction transistor having an anode, a gate and a cathode;

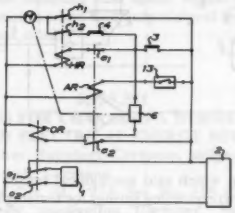
b timing means connected to the gate of said programmable unijunction transistor for energizing said programmable unijunction transistor;

c a power supply; and
d a second transistor connected to said timing means and to said power supply providing energy from said power supply to said timing means.

3,939,385
SIGNALLING APPARATUS FOR SHIPS

Bengt Lennart Holm, Malmo, and Gustav Rudolf Edelberg, Staffanstorp, both of Sweden, assignors to Kockums Mekaniska Verkstads AB, Malmo, Sweden

Filed Jan. 3, 1975, Ser. No. 538,275
Claims priority, application Sweden, Jan. 4, 1974, 7400075
Int. Cl.² H01H 47/22
U.S. Cl. 317—157 4 Claims

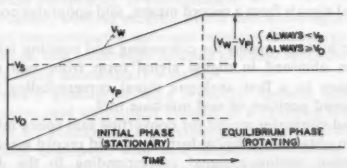


1. In a signalling apparatus for ships, said apparatus being primarily intended for signalling in poor visibility and comprising
a current source,
an electric signalling device,
a first relay for connecting said signalling device to said current source,
a motor,
a plurality of alternatively selectable make contacts which are periodically closable by means of said motor and are connected in parallel with each other and in series with said first relay to said current source, and
a second self-holding relay for coupling said motor to said current source,
the improvement comprising a plurality of parallel-connected switches for manual signalling and at least one third relay which is connected to said current source in series with said parallel-connected switches and has a break contact coupled into the holding current path of said second relay, and at least one make contact for connecting said signalling device to said current source.

3,939,386
TECHNIQUE FOR CHARGING DIELECTRIC SURFACES TO HIGH VOLTAGE

Charles F. Gallo, and Thomas J. Hammond, both of Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 1975, Ser. No. 545,638
Int. Cl.² H01T 19/00
U.S. Cl. 317—262 A 4 Claims

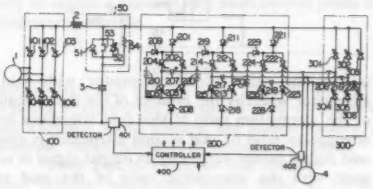


1. A method of applying electrostatic charge to a dielectric surface by means of a corona electrode operatively disposed relative to said dielectric surface, including the steps of:
a. applying a voltage to said corona electrode at a level relative to that of said dielectric surface above the threshold level required to ionize the surrounding atmosphere and generate corona current, and below the sparking level at which sparking occurs, so that corona current flows to said dielectric surface,
b. increasing the voltage of said corona electrode in relation to the increase of voltage of said dielectric surface according to the condition that the potential difference between said corona electrode and said dielectric surface remains between said sparking level and said threshold level, while the voltage of said corona electrode is increased above the sparking level, and
c. initiating relative movement between said dielectric surface and said corona electrode so as to continually bring parts of said dielectric surface from remote to proximate position relative to said corona electrode, so that any part of said dielectric surface is introduced to the distribution field of said corona current progressively,
whereby the voltage of said dielectric surface may be increased above the sparking level.

3,939,387
VARIABLE FREQUENCY POWER CONVERTER FOR AC MOTOR DRIVE

Takeo Maeda, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 19, 1974, Ser. No. 462,534
Claims priority, application Japan, Apr. 20, 1973, 48-44172
Int. Cl.² H02P 5/40
U.S. Cl. 318—227 7 Claims



1. A power converter for driving an AC electric motor comprising a converter connected to an AC power source for converting an AC power into a desired DC power, a smoothing reactor for smoothing the DC output of the converter, an inverter for receiving the DC output smoothed by the smoothing reactor and for producing a rectangular output current of a desired frequency, an AC motor driven by the inverter, a series circuit connected to the inverter on its DC input side and consisting of a switching circuit and a smoothing capacitor which operates, when the output frequency of the inverter has reached a predetermined value, to compose a smoothing circuit with the smoothing reactor, and a feedback circuit consisting of controlled rectifier elements and commutation reactors which operates, when the output frequency of the inverter has reached the predetermined value, to feedback the reactive power of the AC motor.

3,939,388
SELF-BALANCING INSTRUMENT

Eisuke Abe, and Kiyonobu Tanaka, both of Musashino, Japan, assignors to Kabushikikaisha Yokogawa Denki Seisakusho, Tokyo, Japan

Filed Sept. 26, 1974, Ser. No. 509,420
Claims priority, application Japan, Mar. 12, 1974, 49-28732
Int. Cl.² G01R 17/06; G05F 1/00; G05B 6/02
U.S. Cl. 318—321 5 Claims

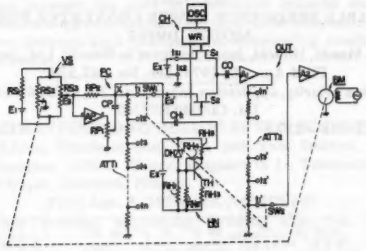
1. A multi-range, self-balancing apparatus, comprising

a. voltage generating means comprising a slide resistor having a movable brush and for generating an output standard voltage corresponding to the position of said brush;

b. phase compensating means comprising is a voltage dividing circuit, a first capacitor and a non-inverting input amplifier having a variable amplification factor, said voltage dividing circuit comprising a resistor and a first range-changing attenuator to divide the output standard voltage of said voltage generating means, said output standard voltage being applied to said input amplifier and said amplifier providing an output signal through said first capacitor to the voltage dividing point of said voltage dividing circuit thereby to provide a phase compensated output signal;

c. a difference signal generator and DC-AC converter means for converting the difference between said output signal from said phase compensating means and a measuring voltage, into an AC signal;

d. output means having a second range-changing attenuator for receiving said AC signal from said difference generator and DC-AC converter means and means for



interlocking said second attenuator with said first attenuator whereby the product of the multiplication of of the attenuation ratio of said first attenuator and the attenuation ratio of said second attenuator is constant, said output means supplying an output signal in accordance with the attenuation ratio of the said second attenuator;

e. balancing motor means having a control phase and a shaft, said shaft being connected to said brush of said slide resistor of said voltage generating means, said output signal from said output means being applied to said control phase of said motor; and

f. white noise generator means comprising a Zener diode and means for connecting the output terminals of said white generator to said phase compensating means, whereby said white noise output is superposed on said phase compensated output signal from said amplifier and thereafter operated upon by said difference generator and DC-AC converter means and said output means and subsequently applied to said motor means thereby to keep the dead zone small and constant for all ranges.

3,939,389

POSITIONING CONTROL APPARATUS

Peter Nopper, Lyss, Switzerland, assignor to Zumbach Electronic - Automatic, Orpund, Switzerland

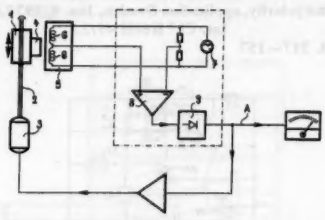
Filed Dec. 21, 1973, Ser. No. 427,050

Claims priority, application Switzerland, Jan. 17, 1973, 613/73

Int. Cl.[2] G05B *19/36*

U.S. Cl. 318—578 **4 Claims**

1. A servo type device of the null-seeking type for positioning a part and wherein a mechanical sensor is provided for engagement with and movement by said positionable part, comprising a reversible motor coupled to said part for effecting reversible movement thereof, a two-component servo signal generator, one component of said generator being a set of reactance coils and the other component being a reactance varying member, one of said signal generator components being stationary and the other component being mounted on said mechanical sensor for movement in one direction or the other from a null signal position in which the coil reactances are balanced so as to increase the reactance of one coil and simultaneously decrease the reactance of the other, means for resiliently biassing said mechanical sensor away from said null signal position in one direction or the other comprising end



stops between which said mechanical sensor is mounted for movement, corresponding springs for biassing said mechanical sensor towards each end stop, and means for optionally rendering one or the other spring effective, a bridge circuit in which said coils are connected in different arms thereof, and means connecting the output terminals of said bridge circuit to said motor whereby the bridge output signal resulting from an unbalanced condition of said reactance coils causes said motor to be actuated to move said part and also said mechanical sensor in the direction which will re-establish the null signal position.

3,939,390

NUMERICAL CONTROL SYSTEM

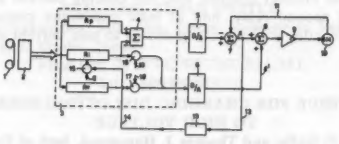
Piero Pomella, and Luciano Lauro, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Continuation of Ser. No. 46,761, June 16, 1970. This application Nov. 14, 1972, Ser. No. 306,188

Claims priority, application Italy, June 21, 1969, 52335/69

Int. Cl.[2] G05B *19/30*

U.S. Cl. 318—604 **7 Claims**



1. Apparatus for controlling the speed and position of a machine tool or the like movable along one or more axes by means of a servometer wherein the position and speed information for operating said servometer are obtained in the form of digital signals from a record means, said apparatus comprising:

first converter means for converting said position information obtained in digital signal form from said record means to a first analogue signal corresponding to the desired position of said machine tool,

second converter means for converting said speed information obtained in digital form from said record means to a second analogue signal corresponding to the desired speed of said machine tool,

adder means for adding said error signal to said second analogue signal and for producing a resultant analogue signal proportional to the sum thereof,

means for monitoring the level of said error signal and for producing an output signal responsive to the exceeding by said error signal level of a predetermined threshold level corresponding to said linear range of operation,

means for subtracting said monitoring means output signal from said digital position signal obtained from said record means, the resulting signal being converted in said first converter means to an analogue signal to replace said first analogue signal in said detector means for maintaining the detector means in said linear range,

means for coupling said output signal from said monitoring means to said second converter means to produce an analogue signal to be coupled to said adder means instead of said second analogue signal when said speed digital signal is nil,

and means for coupling said speed digital signal to said converter means when said output signal from said monitoring means is nil.

3,939,391

APPARATUS FOR CHARGING A HERMETICALLY SEALED ELECTRICAL ENERGY SOURCE

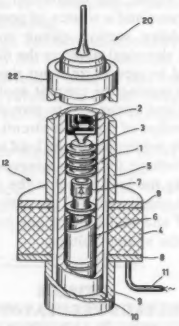
Helmut Winnacker, Burgdorf, Germany, assignor to Preussag Aktiengesellschaft, Germany

Filed Oct. 31, 1974, Ser. No. 519,421

Claims priority, application Germany, Nov. 7, 1973, 2355527

Int. Cl.² H02J 7/00

U.S. Cl. 320—2 **5 Claims**



1. In an underwater device for deep sea use of the type including a water-tight housing, rechargeable energy storage means and energy dissipating means connected thereto, an improved means for charging said rechargeable energy storage means comprising, in combination:

a secondary winding secured within said water-tight housing and interconnected with said rechargeable energy storage means, said water-tight housing and said secondary winding being substantially coaxial;

a primary winding defining a central opening adapted to receive said water-tight housing in a charging state;

means for positioning said primary winding in substantially radial alignment with said secondary winding in said charging state, said primary winding substantially enclosing said secondary winding in said charging state to define an electromagnetic coupling therebetween; and

means for exciting said primary winding, whereby a charging current is induced in said secondary winding.

3,939,392

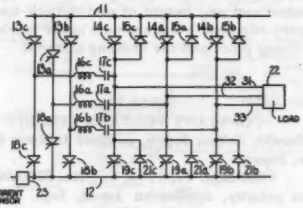
INVERTERS

Brian John Chalmers, Bramhall, and John Philip Gibson, Longsight, both of England, assignors to C.A.V. Limited, Birmingham, England

Filed Dec. 17, 1974, Ser. No. 533,620

Int. Cl.² H02M 1/18

U.S. Cl. 321—11 **5 Claims**



1. An electric inverter comprising in combination, first and second supply lines, an inverting network connected between the supply lines, a plurality of output terminals associated with said inverting network and across which in use a load is connected, a current sensing device in one supply line, and means for modifying the operation of the inverting network and operable in use when the current in said device reaches a predetermined value for stopping current flowing from one supply line to the other, by way of the load, for a predetermined period of time, said means including a delay network whereby no regard is taken of very short current peaks above the predetermined value.

3,939,393

HIGH VOLTAGE RECTIFYING ARRANGEMENT HAVING A FIXING PIECE FOR AN INPUT TERMINAL

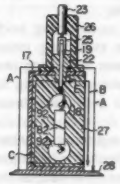
Tadashi Nagasaki; Isamu Kimura, and Shingo Tamura, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 4, 1973, Ser. No. 394,255

Claims priority, application Japan, Sept. 4, 1972, 47-102398

Int. Cl.² H02M 7/00

U.S. Cl. 321—15 **5 Claims**



1. A high voltage rectifying arrangement for supplying a high D.C. voltage to a cathode-ray tube, said arrangement comprising:

a plurality of rectifiers and high voltage condensers constituting a voltage multiplier rectifying circuit;

a mold case made of an insulating material within which said rectifiers and condensers are provided;

a molding material filled within said mold case so that said rectifiers and condensers are embedded in said molding material;

an input terminal connected at one of its ends to said voltage multiplier rectifying circuit within said mold case;

means for connecting said input terminal at the other of its ends to the output of a flyback transformer for supplying a high voltage flyback pulse to said rectifying circuit;

a fixing piece formed of the same kind of material as said molding material for fixing said input terminal, said fixing piece having a first part buried in the molding material within said mold case, a second part projecting out from said molding material, and a bore passing through the first and second parts thereof so that said input terminal is embedded in and led out from said fixing piece at both of its ends through the bore of said fixing piece; and

an insulating rubber cap pressed around said second part of said fixing piece for covering the junction of said input terminal and said output of said flyback transformer to thereby eliminate a leakage path at the junction between the fixing piece and the molding material.

3,939,394

CONSTANT VOLTAGE CIRCUIT

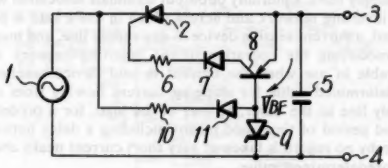
Tadao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 17, 1974, Ser. No. 506,690

Claims priority, application Japan, Sept. 20, 1973, 48-106358

Int. Cl.² G05F 1/64

U.S. Cl. 321—18 **8 Claims**



1. A power supply circuit comprising:

A. first and second input terminals to be connected to an alternating voltage source;

B. first and second output terminals, said second input terminal being connected to said second output terminal;

C. thyristor switching means comprising a first electrode connected to said first input terminal, a second electrode connected to said first output terminal, and a third electrode;

D. semiconductor switching means comprising a first electrode connected to said first output terminal, and second and third electrodes;

E. a first impedance connecting said second electrode of said semiconductor switching means to said third electrode of said thyristor switching means;

F. a second impedance connecting said third electrode of said semiconductor switching means to said first input terminal;

G. a series circuit comprising constant voltage means connecting said third electrode of said semiconductor switching means to said second output terminal; and

H. a capacitor connected in series between said output terminals.

3,939,395

SYSTEM FOR CONNECTING AND DISCONNECTING POWER SOURCE TERMINALS TO A LOAD FOR TIME PROPORTIONAL TO THE CURRENT DRAWN BY THE LOAD

Floyd L. Prestridge, and Harry G. Wallace, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 17, 1972, Ser. No. 244,394

Int. Cl.² G05F 1/56

U.S. Cl. 323—4 **7 Claims**

1. A system for supplying electrical power to a varying load, including,

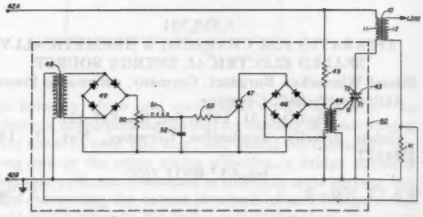
a pair of a.c. power source terminals;

means adapted to connect the terminals to the load;

an electronic switch means in circuit between the terminals and the connecting means and having a gate electrode, the electronic switch responding to a gate drive signal generated from the a.c. power source to disconnect the terminals and connecting means for one half and multiples of one half cycle of alternate polarity of the a.c. source voltage and connect the terminals and connecting means at zero crossing of the a.c. source voltage for one half and multiples of one half cycle of alternate polarity of the source voltage;

a drive circuit generating and programming the gate drive signal and connected to the gate electrode of the electronic switch, including:

a. A generator of the gate drive signal connected to the gate electrode and adapted to be connected to the a.c. power source,



b. A disconnect circuit for effectively disconnecting the generator from the gate electrode in response to an electrical signal, the disconnect circuit connected to the generator and a source of power,

c. And a delay section circuit to generate the programmed electrical signal to the disconnect circuit and connected to receive an input signal;

and means for sensing the current applied to the load as an input signal and connected to provide the input signal to the delay section of the drive circuit, whereby the source terminals are connected to the load at zero crossing of the a.c. source voltage for those intervals in which the power demanded by the load is within the continuous operative range of the components of the system and disconnected for one half and multiples of one half cycle of alternate polarity of the source voltage.

3,939,396

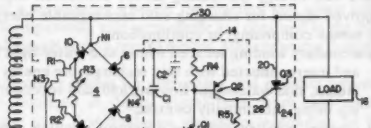
SHUNT A.C. VOLTAGE REGULATOR WITH MODIFIED FULL-WAVE BRIDGE

Raymond E. Larson, Fort Worth, Tex., assignor to ECC Corporation, Euless, Tex.

Filed Feb. 6, 1974, Ser. No. 439,867

Int. Cl.² G05F 1/44

U.S. Cl. 323—8 **11 Claims**



1. A voltage regulator for a current limited A.C. voltage source comprising:

a semiconductor switching device having a pair of power electrodes and a control electrode;

means for connecting the switching device by its power electrodes in shunt with the voltage source;

means for connecting a load in shunt with said switching device;

a full-wave bridge rectifier, a first node of which is connected to one of said power electrodes and a second node of which is connected to the other of said power electrodes, said first and second nodes being located diagonally opposite each other in said rectifier, said rectifier including

a first diode, one electrode of which is connected to said first node,

a first impedance means connected in series between the other electrode of said first diode and a third node of the rectifier,

a second diode, one electrode of which is connected to said second node,

a second impedance means connected in series between the other electrode of said second diode and said third node,

a third impedance means interconnecting the junction of said first diode and said first impedance means with the junction of said second diode and said second impedance means,

a third diode connected between said first node and a fourth node,

a fourth diode connected between said second node and said fourth node, and

central circuit means connected across said third node and said fourth node of said bridge rectifier and responsive to the voltage impressed across said third and fourth nodes for applying a control signal to the control electrode of the switching device to thereby cause the switching device to become conductive when the potential across its power electrodes is of the proper polarity, said control circuit means including

a transistor whose emitter-collector circuit is coupled in series between the control electrode of the switching device and the fourth node of said rectifier,

a semiconductor avalanche device coupled between the third node of said rectifier and the base of said transistor,

fourth impedance means coupled between the base and the emitter of said transistor, and

a capacitor coupled between the fourth node of said rectifier and either the third node of said rectifier or the base of said transistor.

3,939,397

METHOD AND APPARATUS FOR DETERMINING THE TIMING ANGLE IN INTERNAL COMBUSTION ENGINES

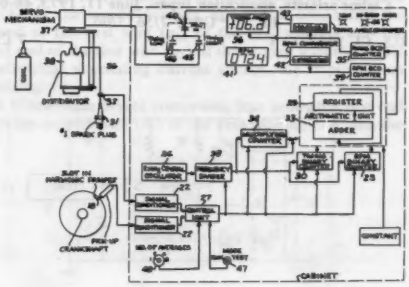
Richard C. Maisonville, Detroit, Mich., assignor to Scans Associates, Inc., Livonia, Mich.

Continuation-in-part of Ser. No. 200,974, Nov. 22, 1971, Pat. No. 3,763,420. This application June 1, 1973, Ser. No. 365,839

Int. Cl.² G01R *29/00*

U.S. Cl. 324—16 T **30 Claims**

1. A method of revealing the average timing angle over all the cylinders of an internal combustion engine with reference to a single predetermined top dead center position, said engine including a distributor, a plurality of cylinders each having a piston, a spark plug, and a crankshaft connected to said piston; said method including measuring the time the engine takes to rotate two full and exact revolutions from top dead center to top dead center from said predetermined top dead center position, determining simultaneously with the measurement of the time taken by the engine to rotate said two revolutions the time of advance with reference to said top dead center position for each individual cylinder in the engine summing these time intervals for each individual cylinder, dividing the values so obtained by the number of cylinders in said engine, thereby obtaining an average time of advance, determining the time said engine takes to rotate one degree during said two revolutions, and dividing the average time



value just obtained by the time the engine takes to rotate one degree, thereby obtaining the true average timing angle.

3,939,398

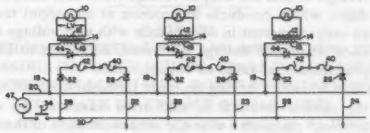
INDICATOR LAMP CIRCUIT HAVING FEEDBACK PROTECTION

Walter J. Kellogg, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1974, Ser. No. 533,407

Int. Cl.² G01R *31/22*

U.S. Cl. 324—21 **14 Claims**



1. An indicator light circuit comprising:

a plurality of indicator lights;

a transformer associated with each of said indicator lights having a primary side and a secondary side with only said associated indicator light being connected across the secondary of said transformer;

test circuit means connected to the primary of each of said transformers for supplying a test current to the primary of all of said transformers when a check of said plurality of indicator lights is required;

signal circuit means associated with each of said plurality of transformers for supplying current to the primary of said associated transformer in response to operation of an external component;

isolating means disposed in the primary connection to each of said transformers for preventing current flow from said signal circuit means through said test circuit means to the primary of any other transformer;

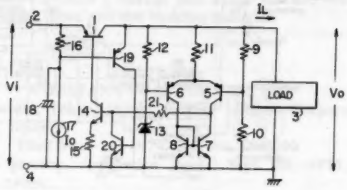
a transformer diode connected across the primary of said transformer; and,

fuse means disposed in series with said isolating means to disconnect said signal circuit means from said test circuit means upon failure of said isolating means.

3,939,399
POWER CIRCUIT WITH SHUNT TRANSISTOR

Michiro Funatsu, Yokohama, and Eiichi Matsumura, Tokyo, both of Japan, assignors to Hitachi, Ltd. and Nippon Electric Co., Ltd., both of, Japan

Filed June 7, 1974, Ser. No. 477,465
Claims priority, application Japan, June 11, 1973, 48-64840
Int. Cl.² G05F 1/56, 5/00
U.S. Cl. 323—22 T 7 Claims



1. A power circuit comprising:

a control transistor having a control terminal, an input terminal and an output terminal, said input terminal being connected with one terminal of the power source while said output terminal being connected with one terminal of a load;

an error detecting amplifier circuit connected across the load, for detecting and amplifying changes of the load voltage;

a drive transistor having a control terminal being connected with the output terminal of said error detecting amplifier circuit, a common terminal being connected with the other terminals of the power source and of the load, and an output terminal, which is for amplifying the output current of said error detecting amplifier circuit and supplying it to said control transistor;

a transistor for detecting the difference between the input voltage to and the output voltage from said control transistor, which conducts to produce at an output terminal an output current in accordance with said voltage difference when said voltage difference decreases to below a predetermined value of voltage; and

a shunt transistor having an input terminal connecting with the control terminal of said drive transistor, an output terminal connected with the other terminals of the power source and the load, and a control terminal connected with the output terminal of said difference detecting transistor to shunt the current supplied from said error detecting amplifier circuit to said drive transistor in accordance with the output current from said difference detecting transistor.

3,939,400
BATTERY TEST UNIT FOR TESTING BATTERIES WHILE STORED IN A CASSETTE-TYPE PACKAGE

Peter F. Steele, 141 Hope St., Stamford, Conn. 06906

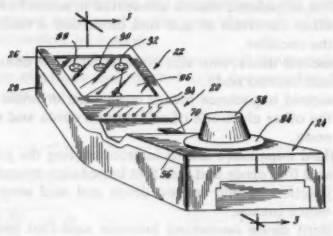
Filed May 23, 1974, Ser. No. 472,540
Int. Cl.² G01N 27/42
U.S. Cl. 324—29.5 7 Claims

1. A battery test unit for testing batteries while stored in a cassette-type package having an electrically conductive sheet base and a housing mounted on the base, with said electrically conductive sheet base being accessible at the outside of said housing, said housing forming a plurality of individual compartments each for storing an individual battery and having a contact access opening in each compartment, the housing and base being arranged to store each battery with one terminal in electrical contact with the conductive sheet base and the other terminal accessible through the contact access opening, said battery test unit comprising:

a body having a receptacle region for receiving the cassette-type package;

main contact means in said unit and being positioned near said receptacle region for making electrical connection with the electrically conductive sheet base of a cassette-type package received in said body receptacle region for simultaneously making electrical connection to the one terminal of each battery in said package which is in electrical contact with said conducting base sheet;

movable selector means in said unit for selectively individually making electrical connection through the cassette



compartment access openings with one terminal of each battery stored in the corresponding cassette housing compartments of the cassette-type package received in said body receptacle region;

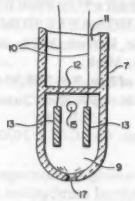
meter means in said unit for testing each battery for metering the charge condition of the battery, said meter means being electrically connected to said selector means and to said main contact means; and

indicator means in said unit associated with said meter means for indicating the charge condition of the individual battery with which said selector means is making electrical connection.

3,939,401
CONDUCTIVITY CELL ELECTRODE ENCLOSURE

Constance Van Lenten, Hawthorne; Robert Rosenthal, Tenafly, and Elmer A. Sperry, III, Pompton Plains, all of N.J., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 50,278, June 26, 1970, abandoned.
This application June 2, 1972, Ser. No. 259,347
Int. Cl.² G01N 27/28
U.S. Cl. 324—30 B 10 Claims



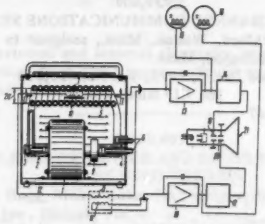
1. A cell for measuring the conductivity of fluids having two parallel planar electrodes mounted interior to the cell comprising; a section of glass tubing separated into first and second volumes by an interior glass divider, said first volume having two vent holes oppositely disposed and symmetrically located in the walls of said first volume, the end of said section of glass tubing associated with said first volume being tapered to form a third vent hole, the electrodes being mounted within said first volume such that all three vent holes are bisected by a plane of equipotential formed in response to a voltage potential applied to the planar electrodes thereby substantially

confining conduction of current to the interior of said first volume.

3,939,402
OSCILLOGRAPHIC FERROMETER

Vitaly Moritsovich Mogilevsky, ulitsa O. Zhilinoi, 92-b, kv. 23; Vadim Petrovich Ekimov, ulitsa Schetinkina, 48, kv. 33; Alexandr Petrovich Erastov, ulitsa B. Bogatkova, 205, kv. 15, and Viktor Vladimirovich Posokhin, ulitsa A. Lezhena, 30, kv. 35, all of Novosibirsk, U.S.S.R.

Filed Jan. 6, 1975, Ser. No. 538,854
Int. Cl.² G01R 33/14
U.S. Cl. 324—34 R 1 Claim



1. An oscillographic ferrometer comprising: a magnetizing means producing a magnetic field for placing a test sample thereinto; a magnetization measuring channel cooperating with said magnetizing means; a magnetizing field measuring channel cooperating with said magnetizing means and effecting together with said magnetization measuring channel the measurements of dynamic magnetization loop parameters of said test sample; said magnetizing means including a step-down transformer having a single-turn secondary winding, a single-layer ellipsoidal solenoid connected to said secondary winding and having a constant density of rectangle-shaped turns along the generatrix thereof, said solenoid being adapted for receiving a test sample and having the geometrical dimensions thereof selected in agreement with the following relationship:

$$K = 0.9965\left(\frac{b_L}{L}\right) 0.4361$$

$$\frac{b_L}{L} \epsilon\ 0.1 \text{ to } 0.6$$

$$a = 0.05L$$

where K is the contraction coefficient of said solenoid generatrix,

$2b_L$ is the width of the linear rectangular profile representing the geometrical locus of the cross section centers of said solenoid end turns;

$2a$ is the height of the linear rectangular profile representing the geometrical locus of the cross section centers of said solenoid end turns,

2L is the length of said solenoid between the cross section centers of said end turns.

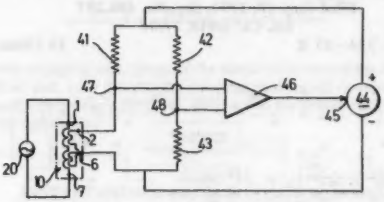
3,939,403
DEVICE FOR MAINTAINING CONSTANT THE TEMPERATURE OF A COIL FED BY AN A.C. CURRENT SOURCE

Marie-Claire Stassart, rue de Londres 7, 4000 Liége, Belgium

Filed June 3, 1974, Ser. No. 476,144
Claims priority, application Belgium, Apr. 11, 1974, 143115
Int. Cl.² G01R 33/12; H01H 47/26
U.S. Cl. 324—40 1 Claim

1. In a device for maintaining constant the temperature of a coil fed by an electrical alternating current source, said coil comprising two windings (A and B), each of said windings being formed by winding simultaneously two insulated wires (a_1, b_1 and a_2, b_2 respectively) having the same size, said two wires of each winding extending side by side and having each a first and a second end, said two windings having the same number of single turns wound in the same direction, means connecting the second end of the first wire (a_1) of the first winding (A) to the first end of the first wire (a_2) of the second winding (B), means connecting the second end of the second wire (b_1) of the first winding to the second end of the second wire (b_2) of the second winding, and means connecting the first end of the first wire (a_1) of the first winding and the second end of the first wire (a_2) of the second winding across said electrical alternating current source, the improvement comprising:

a. a Wheatstone bridge comprising four arms, the first end of the second wire (b_1) of the first winding (A), and the



first end of the second wire (b_2) of the second winding (B) being connected into the bridge to form one leg thereof, the other three legs consisting of resistors, such that said second wires are traversed by an electric current in opposite directions and that the resistances of said second wires (b_1, b_2) are balanced by said resistors,

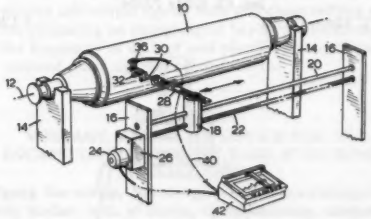
b. a differential amplifier having two inputs, said inputs being connected to the end terminals of a first crossarm of said bridge, and

c. a voltage-controlled direct source having two terminals and a control input, said two terminals being connected to the end terminals of the second crossarm of said bridge and said control input being connected to the output of said differential amplifier.

3,939,404
METHOD OF TESTING FOR AND PREVENTING THE POSSIBILITY OF CRACKING, SPALLING OR LIKE DEFECTS IN ROLLING MILL ROLLS BY DETERMINING THE RATE OF CHANGE IN HARDNESS

William H. Tait, Hamilton, Canada, assignor to Dominion Foundries and Steel, Limited, Hamilton, Canada

Filed July 10, 1974, Ser. No. 487,092
Int. Cl.² G01R 33/12
U.S. Cl. 324—40 13 Claims



1. A method of testing for and at least reducing the possibility of the occurrence of cracking, spalling or like defects in the exterior cylindrical surface of a cylindrical steel rolling mill roll, the method including the steps of:

a. determining the rate of change of hardness along a reference direction for at least a part of the roll surface to find locations therealong having rates of change greater than

a predetermined maximum value known to foreshadow the possibility of the occurrence of defects for the roll and the conditions to which it is subjected in operation, and

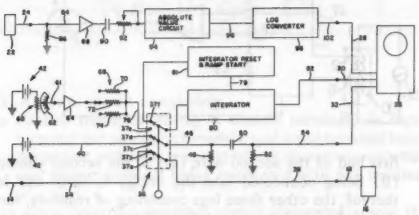
b. when the rate of change of hardness along the reference direction exceeds the said maximum value removing material from the roll including the tested surface until the rate of change of hardness is below another predetermined maximum value.

3,939,405

APPARATUS AND METHOD FOR MAKING DECAY RATE MEASUREMENTS

John Stefan Mutziger, East Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed Aug. 19, 1974, Ser. No. 498,297
Int. Cl.[2] G01R 27/00
U.S. Cl. 324—57 R 10 Claims



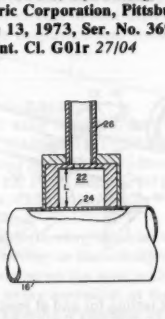
1. Apparatus for indicating the exponential rate of decay of oscillation in test objects such as mechanical structures, acoustical enclosures, or electrical circuits which have been excited and providing simultaneous indication of an adjustable reference decay rate signal for comparison comprising: means for exciting the test object and terminating the excitation; means for detecting the excitation response and providing a signal proportional thereto; means for receiving and processing the excitation response signal to produce an absolute-valued, log-converted decaying data signal; means for producing a variable, integrated reference decay rate signal simultaneously with the decaying data signal; indicator means for simultaneously presenting the reference decay rate signal and decaying data signal for comparison.

3,939,406

MICROWAVE FLUID FLOW METER

Thomas R. Billeter; Lee D. Philipp, both of Richland, Wash., and Richard R. Schemmel, Lynchburg, Va., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 13, 1973, Ser. No. 369,664
Int. Cl. G01r 27/04
U.S. Cl. 324—58.5 C 5 Claims



1. Apparatus for measuring the rate of liquid flow within a fluid conduit comprising:

a first microwave sensor having a resonant microwave cavity directly responsive to the fluid pressure internal of the conduit to provide a representative electrical output indicative thereof, said microwave cavity being exposed to the interior of the fluid conduit at a first given fixed location therealong outside the path of fluid flow;

a second microwave sensor having a second resonant microwave cavity directly responsive to the fluid pressure internal of the conduit to provide a representative electrical output indicative thereof, said second microwave cavity being exposed to the interior of the fluid conduit at a second given fixed location therealong outside the path of fluid flow and spaced from said first location; and

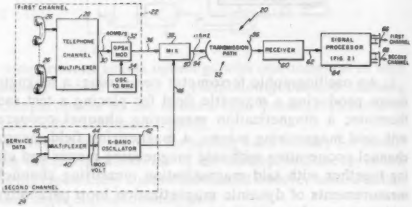
means for comparing the respective outputs from said first and second sensors and responsive thereto to provide a measurement of fluid flow within the conduit.

3,939,407

PLURAL CHANNEL COMMUNICATIONS SYSTEM

William J. Bickford, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 3, 1973, Ser. No. 421,013
Int. Cl.[2] H04L 7/02
U.S. Cl. 325—47 10 Claims



9. A system utilizing a first signal and a second signal, said second signal having a spectrum wherein a carrier is present, said first signal being mixed with said second signal, said system comprising:

means coupled to said mixed signals for modulating said mixed signals with a first and a second demodulated replica of said first signal to produce first and second modulator output signals, said modulating means including means for combining said first and second output signals to produce said second signal;

means coupled to said modulating means for filtering a carrier of said second signal resulting from said modulating; and

first and second means coupled to said transmitting means and responsive to said carrier of said filtering means for demodulating said transmitted signal to provide said first and said second demodulated replica of said first signal, one of said demodulating means including means for shifting the phase of a carrier coupled to said one demodulating means relative to the phase of a carrier coupled to the other of said demodulating means, said demodulating means coupling said demodulated replica of said first signal to said modulating means.

3,939,408

CONDUCTIVITY CELL AND MEASURING SYSTEM

Neil L. Brown, Falmouth, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

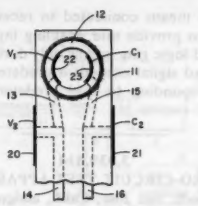
Filed Aug. 5, 1974, Ser. No. 494,808
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—30 B 11 Claims

1. A conductivity cell comprising in combination

a T-shaped structure having as its crosshead an open-ended tube made of electrically non-conducting material;

a pair of external electrodes affixed to opposite sides of the stem of said T-shaped structure;

a pair of internal electrodes affixed to diametrically opposite arcuated portions of the inner wall surface of said tube,



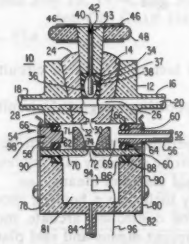
said external and internal electrodes being in the same vertical plane which is perpendicular to the central axis of said tube.

3,939,409

PARTICLE STUDY DEVICE AND SAMPLE METERING MEANS USED THEREIN

Walter R. Hogg, Miami Lake, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Aug. 1, 1974, Ser. No. 493,828
Int. Cl.² G01N 27/07; G01F 13/00
U.S. Cl. 324—71 CP 34 Claims



1. In a particle study device wherein particulate matter in liquid suspension is passed through a sensing zone the improvement comprising a sample metering means having an input for receiving a sample of particulate matter, a drain for expelling a sample of particulate matter, an ejection port, and means for trapping a volume of sample therein, said sample metering means further including an ejecting means operative to eject a predetermined amount of said trapped volume of sample through said ejecting port, and coupling means coupled to said sample metering means to, a source of diluent and to said sensing zone for combining said ejected predetermined amount of said trapped sample and diluent to form said liquid suspension and for coupling said liquid suspension to said sensing zone.

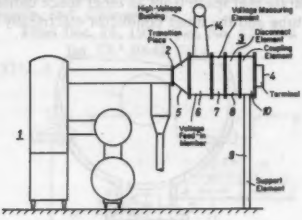
3,939,410

ARRANGEMENT FOR TESTING METAL-CLAD, HIGH-VOLTAGE INSTALLATIONS

Rainer Bitsch, and Armin Diessner, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 30, 1974, Ser. No. 474,652
Claims priority, application Germany, May 30, 1973, 2328120
Int. Cl.² G01R 31/02
U.S. Cl. 324—72 6 Claims

1. An arrangement for making tests on a metal-clad, high-voltage installation filled with insulating gas, particularly tests for detecting partial discharges, comprising a flange formed on the metal enclosure of the installation and defining an access opening in the same; an equipment unit having a metal encapsulation for accommodating the apparatus for making the tests, said metal encapsulation having a flange for removably engaging said flange of the metal enclosure of the installation; and, cover means for covering said access opening when said equipment unit is not attached to the metal enclosure of the installation.

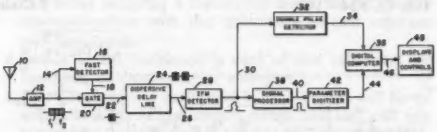


3,939,411

INSTANTANEOUS FREQUENCY MEASUREMENT SYSTEM

Wilbur G. James, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1974, Ser. No. 511,816
Int. Cl.² G01R 23/02
U.S. Cl. 324—77 H 9 Claims



1. Apparatus for measuring the frequencies of a plurality of simultaneously received pulse signals, comprising:

sampling means having an input connected to receive said plurality of simultaneously received pulse signals for sampling a portion substantially less than one pulse of each of said input signals,

phase shifting means connected to receive said sampled signals from said sampling means for producing output signals each shifted in phase by an amount related to the magnitude of its corresponding frequency, and

instantaneous frequency measurement means connected to receive said output signals from said phase shifting means for producing an output signal having a measurement of the frequency of each of said plurality of simultaneously received pulse signals encoded therein.

3,939,412

VOLTAGE MEASURING DEVICE FOR AN ENCAPSULATED HIGH-VOLTAGE SWITCHING INSTALLATION

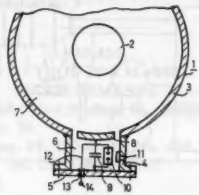
Wolfgang Hermstein, Nurnberg; Gerhard Rosenberger, and Willi Muller, both of Berlin, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 8, 1974, Ser. No. 495,820
Claims priority, application Germany, Aug. 10, 1973, 2341073
Int. Cl.² G01R 31/00
U.S. Cl. 324—96 14 Claims

1. A voltage measuring device for use with an encapsulated, high-voltage switching installation including an inner conductor within a grounded metallic outer tube, which comprises:

a. means for widening said outer tube to thereby form a space for locating certain portions of said measuring device;

b. auxiliary electrode means positioned in said space so as to separate said space from an inner space defined by t'·e outer tube and the inner conductor electrically insulated



from the outer tube, said auxiliary electrode means and said inner conductor forming a first capacitor; and,

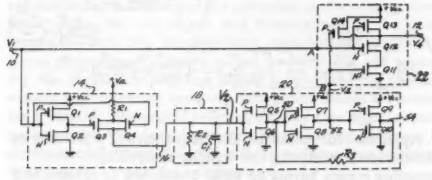
c. means operatively connected to said first capacitor for responding to electrical characteristics of said first capacitor to thereby give an indication of the voltage of said installation.

3,939,413

LOW CUTOFF DIGITAL PULSE FILTER ESPECIALLY USEFUL IN ELECTRONIC ENERGY CONSUMPTION METERS

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 13, 1974, Ser. No. 505,799
Int. Cl.² G01R 21/00, 11/32
U.S. Cl. 324—142 **9 Claims**



1. In an electronic energy consumption meter comprising sources of signal variables representing voltage and current flowing in a monitored electrical circuit, a time-division multiplier for multiplying said variables and producing an analog power consumption signal, an A/D converter for producing digital pulses each representing the consumption of a predetermined unit of energy, and means for accumulating the number of digital pulses as an indication of total energy consumption, the improvement comprising a low cut-off pulse filter interposed between said A/D converter and said means for accumulating for passing only those digital pulses occurring above a predetermined cut-off repetition rate, said filter comprising:

logic gate means having a first input connected to respond to said digital electrical pulses, a second input and an output for providing output electrical pulses directly corresponding to said digital pulses only when enabled by an enabling signal being applied to said second input,

energy storage and dissipation means connected for short term storage and eventual dissipation at a predetermined rate of electrical energy applied thereto and for providing an averaged signal representing the amount of energy stored at any given time,

a source of electrical energy,

switch means connected between said source and said energy storage and dissipation means and connected for control by said digital electrical pulses for providing input pulses of energy to said energy storage and dissipation means corresponding to the occurrences of said digital electrical pulses whereby the value of said averaged signal corresponds to the repetition rate of said digital electrical signal, and

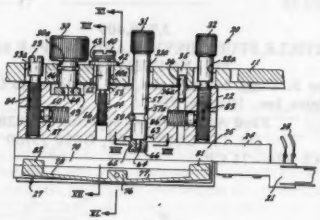
trigger circuit means connected to receive said averaged signal and to provide said enabling input to the second input of said logic gate means only during the time when said averaged signal exceeds a predetermined threshold value corresponding to said predetermined repetition rate.

3,939,414

MICRO-CIRCUIT TEST APPARATUS

Jacques Leon Roch, San Jose, Calif., assignor to Electroglas, Inc., Santa Clara, Calif.

Filed Jan. 28, 1974, Ser. No. 436,844
Int. Cl.² G01R 31/02, 31/22
U.S. Cl. 324—158 F **16 Claims**



1. An assembly for testing integrated circuit components comprising:

platform means supporting integrated circuit components to be tested,

support means cooperating with said platform for mounting at least one test probe assembly in a predetermined position relative to said platform means,

said probe assembly including a housing mounted on said support means for controlled arcuate movement with respect to said support means and said platform means,

said housing including slide means mounting a probe test unit for controlled axial movement with respect to said housing,

means assoociated with said housing for effecting controlled rotational movement of said slide means and said probe test unit and for effecting controlled rotational movement of said slide means about at least one of two points producing effecting vertical movement with respect to said housing with respect to said housing, and

means to maintain said predetermined position of said housing and probe test unit with respect to said platform means.

3,939,415

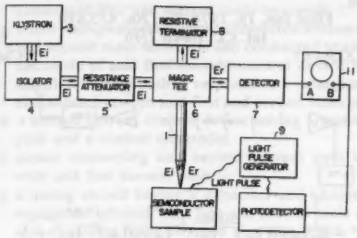
METHOD OF AND DEVICE FOR MEASURING LIFE TIME OF CARRIERS OF SEMICONDUCTOR

Yoshio Terasawa, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed July 24, 1974, Ser. No. 491,230
Claims priority, application Japan, July 27, 1973, 48-84013
Int. Cl.² G01R 31/26, 27/06
U.S. Cl. 324—158 D **5 Claims**

1. A method of measuring the life time of carriers of a semiconductor, comprising the steps of supplying energy to a sample of a semiconductor to produce carriers therein, directing a microwave signal to a portion of said semiconductor through an antenna to obtain a microwave signal reflected therefrom, said antenna being a waveguide whose one end portion is tapered and has a drawing pen shaped opening, and

detecting the reflected microwave signal from said semiconductor portion representative of the variation in the concentration of said carriers with respect to time which variation has a predetermined relationship to the life time of said carriers.

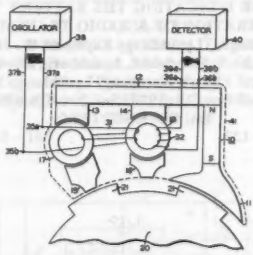


3,939,416

VEHICLE SPEED SIGNAL PULSE SOURCE

Arthur Maskery, Chippenham, England, assignor to Westinghouse Brake & Signal Co., Ltd., Chippenham, England

Filed July 15, 1974, Ser. No. 488,267
Int. Cl.² G01P 3/48
U.S. Cl. 324—174 **10 Claims**



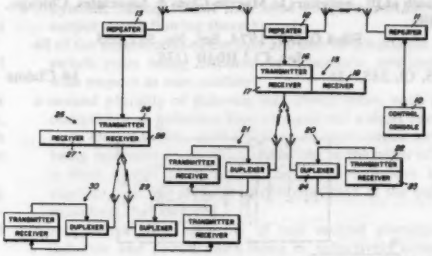
1. A vehicle speed signal pulse source comprising, input and output terminals, a substantially E-shaped magnetic structure wherein two legs of the E form a pair of magnetic circuit branches, a common primary winding wound about both of said pair of magnetic circuit branches and connected to said input terminals, a second winding wound about one of said pair of magnetic circuit branches and connected to said output terminals, a signal connected to said input terminals to produce magnetic fluxes in both of said pair of magnetic circuit branches, the last leg of the E including a permanent magnet forming another magnetic circuit branching of said substantially E shaped magnetic structure and causing magnetic flux to pass through both of said pair of magnetic circuit branches, and a rotatable magnetizable member positioned adjacent the legs of the E for increasing the reluctance in one of said pair of magnetic circuit branches at a time at a rate dependent upon the speed of rotation of said magnetizable member.

3,939,417

EMERGENCY COMMUNICATIONS SYSTEM

Gary A. Cannalte, Hoffman Estates; Richard J. Crouse, Palatine; Richard D. Koenig, Elgin; Thomas J. Rollins, Arlington Heights, and Donald L. Walker, Addison, all of Ill., assignors to Motorola, Inc., Chicago, Ill.

Filed Dec. 18, 1973, Ser. No. 425,908
Int. Cl.² H04B 7/14, 1/40
U.S. Cl. 325—5 **11 Claims**



1. An emergency communications system comprising:

a. a control console including a transceiver with a transmitter and receiver portion;

b. a plurality of terminal stations positioned at spaced apart locations remote from said console, each including a transceiver with a transmitter and receiver portion in communication with said console;

c. a plurality of call boxes fixedly positioned at spaced apart locations adjacent to each terminal station, each of said call boxes including a transceiver tuned for full duplex communications with the transceiver in said adjacent terminal station;

d. switch means positioned in each of said call boxes for operation by a person in an emergency;

e. first circuit means positioned in each of said call boxes and connected to said switch means and said call box transceiver for causing said call box transceiver to transmit a first signal of predetermined duration to the transceiver of said console through the transceiver in said adjacent terminal station upon actuation of said switch means;

f. first circuit means positioned in said console and connected to the console transceiver for causing to be transmitted a signal to said terminal stations, upon reception of the first signal from one of said call boxes, for keying the transmitter portion of the transceiver in each of said terminal stations to provide a busy signal to all remaining call boxes;

g. ringing circuit means positioned in each of said call boxes and connected to said call box transceiver for providing a ringing signal to the person operating said one of said call boxes upon reception of a signal from the keyed transmitter portion of the transceiver in its respective adjacent terminal station responsive to said signal;

h. transmitted from said console second circuit means positioned in each of said call boxes and connected to said first circuit means for automatically causing to be transmitted by said call box transceiver subsequent to the first signal, a second signal indicative of the address of said call box and condition of predetermined portions of the call box;

i. second circuit means positioned in said console and connected to the console transceiver for indicating the address and condition of said calling call box upon reception of the second signal from said call box transceiver by way of the transceiver in its respective adjacent terminal;

j. station busy signal indicating means positioned in each of said call boxes and connected to receive busy signals from said adjacent terminal stations for indicating one of said

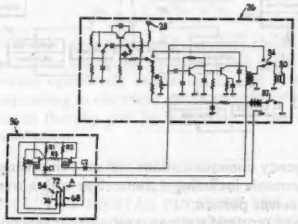
call boxes in the system is in use upon reception of a busy signal; and

k. transducer means mounted in each of said call boxes and in said control console and operatively connected to the transceivers therein for voice communication between any of said call boxes and said control console.

3,939,418
WALKIE-TALKIE DEVICE

Howard J. Morrison, Deerfield, and Albert G. Keller, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 7, 1974, Ser. No. 512,553
Int. Cl.² H04B *1/38*
U.S. Cl. 325—16 **14 Claims**



1. In a walkie-talkie unit including a microphone/speaker connected to a radio transceiver including an RF source, a power supply, a modulator, an audio amplifier, an antenna, a detector for transmitting and receiving audio signals and switch means for selectively operating in either a transmit or receive mode, the improvement comprising:

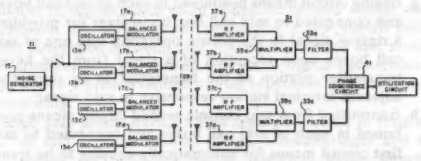
a selectively actuatable audio signal generator connected to said transceiver for generating an audio signal of at least one frequency for transmission to another walkie-talkie when in a transmitting mode as well as generating sound from its speaker when in a receiving mode; and

a hand manipulatable actuator to selectively actuate said signal generator in either of said modes.

3,939,419
SECURITY REMOTE CONTROL METHOD AND SYSTEM

Herbert G. Lindner, Red Bank, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 6, 1956, Ser. No. 620,776
Int. Cl.² H04K *1/00*; H04B *1/00*
U.S. Cl. 325—33 **4 Claims**

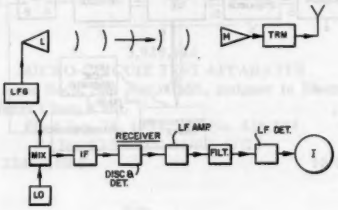


1. A security remote control system comprising a pair of carrier generators, means for balance modulating both the carriers from said generators by a single source of noise at a first station and means for transmitting only the side bands, a receiver at a second station for said side bands, means for combining the side bands of said pair of carriers to provide a beat frequency signal corresponding to the frequency difference of said pair of carriers, narrow band filter means to isolate said signal, and means responsive to said signal for controlling an operation at said second station.

3,939,420
DEBUGGING ARRANGEMENT

Sture Risberg, Enskede; Alf Lindgren, Taby; Kjell Rixon; Rickard Wallden, both of Tyreso, and Bengt Brundin, Solentuna, all of Sweden, assignors to Sture Risberg, Enskede, Sweden

Filed Jan. 15, 1974, Ser. No. 433,610
Int. Cl.² H04B *1/46*
U.S. Cl. 325—67 **9 Claims**



2. Apparatus responsive to the presence of a covert radio transmitter or "bug" within a confined space having a microphone including:

tone generating means for generating a tone with a predetermined frequency,

a loudspeaker for transmitting said tone within said confined space with a predetermined amplitude,

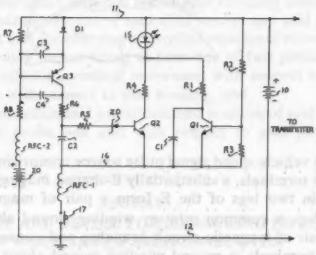
a receiver responsive to radio frequency including a low-frequency amplifier for amplifying said tone and a narrow band-pass filter tuned to pass said tone signal,

and means responsive to the amplitude of the output of said filter.

3,939,421
CIRCUIT FOR INDICATING THE BATTERY VOLTAGE AND OPERATION OF A RADIO TRANSMITTER

Jerry M. Barringer, Lynchburg; Raymond W. Harris, Rustburg, and John B. Woodward, Lynchburg, all of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Nov. 25, 1974, Ser. No. 526,698
Int. Cl.² H04B *17/00*
U.S. Cl. 325—133 **1 Claim**



1. A circuit for indicating the operation of a radio transmitter and the voltage of a battery that powers said transmitter comprising:

a. a first main terminal for connection to a first terminal of a battery;

b. a second main terminal;

c. a switch connected to said second main terminal for connecting said second main terminal to a second terminal of said battery in response to said transmitter being operated;

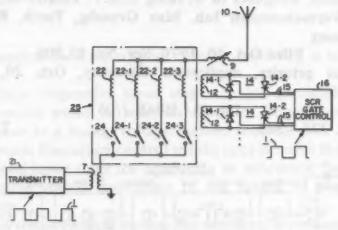
d. a light emitting device;
e. a first current control device having a first current path and a control electrode;
f. means connecting said light emitting device and said first current path of said current control device in series between said first and second main terminals;
g. a first voltage sensing circuit connected between said first and second main terminals and connected to said control electrode of said first current control device for closing said first current path in response to a voltage of selected magnitude between said first and second main terminals;
h. a second current control device having a second current path and a control electrode;
i. means connecting said second current path in parallel with said first current path;
j. a timing circuit having a capacitor and charging circuit connected between said first and second main terminals, said capacitor being charged at a rate which varies as a function of the magnitude of voltage between said first and second main terminals;
k. a second voltage sensing circuit for supplying charging current to said charge circuit comprising means for comparing the voltage of said battery and a predetermined voltage for providing said charging current and
l. means connecting said capacitor to said control electrode of said second current control device for closing said second current path in response to a selected charge voltage on said capacitor, said capacitor being discharged by said closed second current path and said second current path being opened in response to said capacitor being discharged;

whereby said light emitting device is energized steadily by said closed first current path in response to a voltage that exceeds said selected magnitude, and whereby, when said first current path is open, said light emitting device is energized and de-energized by said second current path at a rate determined by the charge and discharge rate of said capacitor.

3,939,422
DYNAMIC ANTENNA TUNER

Louis F. Deise, Timonium, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 12, 1974, Ser. No. 441,921
Int. Cl.² H04B 1/04
U.S. Cl. 325—163 4 Claims



1. For use with a transmitter of the type employing frequency shift keying modulation, a system for dynamically tuning the resonant frequency of the transmitter antenna to alternate between resonant frequencies in synchronism with the repetitive shifts in frequency caused by frequency shift keying modulation, said transmitter having a range of RF output signal operating frequencies which is large relative to the frequency shift caused by frequency shift key modulation, said system comprising:

a dynamic tuning circuit operatively connected to the transmitter antenna in series circuit therewith,

means for coupling the transmitter RF output signal into the series circuit of said antenna and dynamic tuning circuit,

said dynamic tuning circuit comprising a first plurality of inductance and switch pairs, each pair comprising a discrete helical coil and a connect-disconnect switch, each connect-disconnect switch being individually controllable to selectively establish either one or the other of: (A) a connect condition of the helical coil in which the coil is connected into said dynamic tuning circuit so that at least a portion of the transmitter RF output signal is flowing therethrough, and (B) a disconnect condition of the helical coil in which the coil is disconnected from said dynamic tuning circuit with none of the transmitter RF output signal flowing therethrough,

all of the helical coils of the first plurality of inductance and switch pairs being disposed in concentric relationship with respect to one another;

a second plurality of inductor and switch pairs, each pair comprising an inductive loop element and a short circuit-open circuit switch, each short circuit-open circuit switch being operative to establish either one or the other of: (i) a short circuit condition of the paired inductive loop element, and (ii) an open circuit condition of the paired inductive loop element,

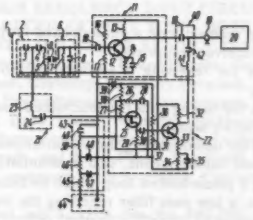
the inductive loop elements of said second plurality of inductor and switch pairs being in inductively coupled relationship with the concentric arrangement of helical coils of the first plurality of inductance and switch pairs; and

means for commonly operating all of the short circuit-open circuit switches of said second plurality of inductance and switch pairs in synchronous relationship with the frequency shift keying modulation to alternately short circuit and open circuit all of the inductive loop elements, said inductive loop elements of the second plurality of inductor and switch pairs when in their short circuited condition being operative to reflect a decrease of inductance into any helical coil which is connected into said dynamic tuning circuit.

3,939,423
AUTOMOBILE ACTIVE RECEIVING ANTENNA

Viktor Ivanovich Zakharov, Trifonovskaya, ulitsa 51, korpus 7, kv. 32; Alexandr Alexeevich Zinichev, 15 Parkovaya ulitsa, 24, korpus 1, kv. 59, and Oleg Ulyanovich Melnichuk, Chechersky pereulok, 4, korpus 1, kv. 20, all of Moscow, U.S.S.R.

Filed July 1, 1974, Ser. No. 485,351
Int. Cl.² H04B 1/18; H01Q 1/32
U.S. Cl. 325—312 3 Claims



1. An active receiving broadcast band antenna for an automobile radio receiver of amplitude and frequency modulated signals having a common feeder, comprising: an antenna body mounted within the automobile interior; a bandpass filter having an input circuit including a capacitor, said capacitor comprising a metal member insulated from the automobile body and arranged in close vicinity to the automobile windshield and a structural member of said automobile body, said bandpass filter being included within said antenna body; a frequency-modulated signal amplifier positioned within said antenna body having an input connected to said bandpass

filter and having an output; a power supply circuit for said frequency-modulated signal amplifier; a frequency correcting network positioned within said antenna body; an amplitude-modulated signal amplifier positioned within said antenna body and having an input connected to said bandpass filter via said frequency correcting network and an output; a power supply circuit for said amplitude-modulated signal amplifier; an interference filter connected to said power supply circuits of said frequency-modulated and amplitude-modulated signal amplifiers; and a frequency separation filter, said outputs of said frequency-modulated and amplitude-modulated signal amplifiers being connected to said common feeder of said radio receiver via said frequency separation filter.

3,939,424

RADIO RECEIVER WITH A PHASE LOCKED LOOP FOR A DEMODULATOR

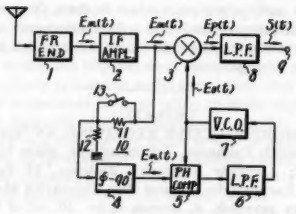
Ikuo Shimizu, and Masakatsu Toyoshima, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 4, 1974, Ser. No. 503,100

Claims priority, application Japan, Sept. 8, 1973, 48-101480; Sept. 10, 1973, 48-101893

Int. Cl.² H04B 1/26

U.S. Cl. 325—346 7 Claims



1. A radio receiver with a phase-locked loop for a demodulator, said receiver comprising:

A. means for receiving a plurality of modulated carrier signals;

B. means for tuning to a predetermined one of the modulated carrier signals;

C. means for demodulating the predetermined carrier signal from said tuning means, said demodulating means comprising a phase-locked loop which includes a phase comparator, a low pass filter receiving the output from said comparator to provide a control voltage and a variable oscillator controllable by said control voltage, said phase comparator receiving said predetermined modulated carrier signal and the output signal of said variable oscillator, and means for synchronously detecting the output signal of said variable oscillator with said predetermined modulated carrier signal to produce a demodulated signal; and

D. means for controlling the amplitude of the predetermined modulated carrier signal received by said phase comparator in such a way that the capture range and lock range of said phase-locked loop are controlled in response to the tuning operation of said tuning means.

3,939,425

NOISE-SQUELCHING CIRCUIT USING A PHASE-LOCKED LOOP

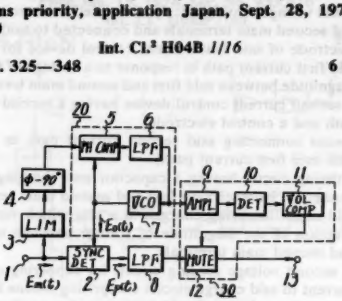
Masakatsu Toyoshima, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 17, 1974, Ser. No. 506,691

Claims priority, application Japan, Sept. 28, 1973, 48-109119

Int. Cl.² H04B 1/16

U.S. Cl. 325—348 6 Claims



1. A noise-squelching circuit comprising:

A. receiving means for receiving a modulated carrier signal within a predetermined frequency band;

B. a phase-locked loop comprising a phase comparator, a low pass filter, and a voltage-controlled oscillator, said oscillator being controlled by an output signal from said filter to provide a carrier signal having a predetermined frequency related to the frequency of said modulated carrier signal when a modulated carrier signal is applied to said phase comparator;

C. a demodulated signal path; and

D. a muting circuit connected to said filter to be controlled by the output signal thereof and connected to said signal path to permit the passage of signals along said path only in response to a predetermined output signal level from said filter corresponding to a phase-locked condition of said loop.

3,939,426

METHOD AND ARRANGEMENT FOR FURNISHING AN INDICATION OF MULTIPATH RECEPTION IN AN FM RECEIVER

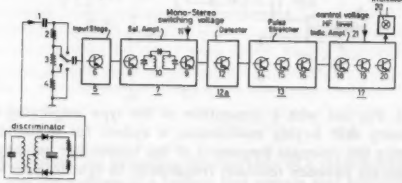
Karl Traub, Furth, and Günther Benecke, Nurnberg, both of Germany, assignors to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh. Max Grundig, Furth, Bavaria, Germany

Filed Oct. 30, 1970, Ser. No. 85,506

Claims priority, application Germany, Oct. 20, 1969, 1952739

Int. Cl.² H04B 1/06

U.S. Cl. 325—363 7 Claims



1. In a frequency modulation receiver having discriminator means furnishing a discriminator output signal having a plurality of desired frequency signals in the absence of multipath reception and at least one harmonic of one of said desired frequency signals in the presence of multipath reception, the frequency of said harmonic differing from the frequencies of said desired frequency signals, an arrangement for furnishing

an indicator signal indicative of said multipath reception, comprising, in combination, narrow bandwidth filtering means connected to said discriminator means for passing said harmonic when present, while rejecting signals of frequencies both higher and lower than said harmonic, thereby furnishing filtered harmonic signals occuring only during multipath reception, said narrow bandwidth filtering means comprising selective amplifier means tuned to a frequency between 15 kHv and 19 kHv; indicator means connected to said narrow bandwidth filtering means for furnishing said indicator signal in response to said filtered harmonic signals; further comprising rectifier means connected to said narrow bandwidth filtering means, for furnishing a pulse sequence in response to said filtered harmonic signals; and converter means connected between said rectifier means and said indicator means for converting said pulse sequence into a substantially constant voltage for activating said indicator means.

3,939,427

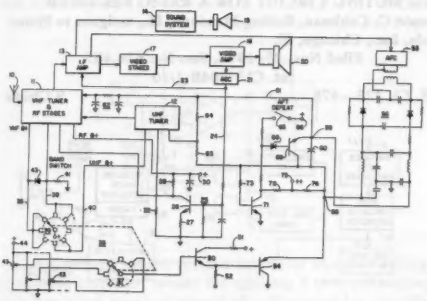
AUTOMATIC FINE TUNING DEFEAT CIRCUIT

David J. Mueller, Northlake, Ill., assignor to Quasar Electronics Corporation, Franklin Park, Ill.

Filed Aug. 5, 1974, Ser. No. 494,637

Int. Cl.² H04B 1/16

U.S. Cl. 325—418 12 Claims



1. A system for a wave signal receiver including in combination:

a voltage responsive tuner stage tunable to different frequencies within at least one band of frequencies in response to a tuning voltage applied thereto;

automatic frequency control means coupled with the output of said tuner stage for producing an automatic frequency control voltage indicative of the tuning of said tuner stage;

tuning voltage supply means for supplying a voltage;

means for coupling said tuning voltage supply means and the output of said automatic frequency control means to said voltage responsive tuner stage to supply said tuning voltage thereto, said tuning voltage being a composite of the voltage supplied by said tuning voltage supply means and the automatic frequency control voltage from said automatic frequency control means; and

switch means coupled to said automatic frequency control means and to said tuning voltage supply means for sensing a predetermined voltage supplied by said tuning voltage supply means, said switch means being operative in response to said predetermined voltage to remove the effect of said automatic frequency control voltage from said composite tuning voltage.

3,939,428

RECEIVER WITH AUTOMATIC PASS BAND CONTROL

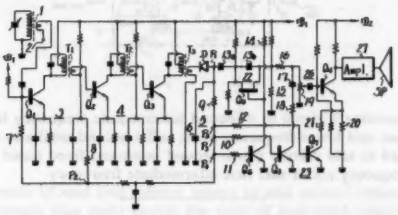
Ikuo Shimizu, Tokyo, and Keiko Ichihara, Ichikawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 26, 1974, Ser. No. 527,483

Claims priority, application Japan, Nov. 30, 1973, 48-135131

Int. Cl.² H04B 1/16

U.S. Cl. 325—427 6 Claims



1. In a receiver for modulated information signals the combination for attenuating higher frequency noise as a function of reduced signal strength comprising:

a detector circuit for demodulating received signals, the output of said detector circuit representing said information and being indicative of the strength of said received signals;

amplifying means for amplifying said detector circuit output to thereby recover said information;

circuit means coupled to said detector circuit and responsive to said detector circuit output indicative of said received signal strength for producing a control signal which is a function of said received signal strength; and

coupling means for interconnecting said detector circuit and said amplifying means, said coupling means including: first actuable filter means for attenuating frequency components above a predetermined range in said detector circuit output, said first actuable filter means being actuated by said control signal; and second actuable filter means for attenuating frequency components below said predetermined range in said detector circuit output, said second actuable filter means being actuated by said control signal and being connected in cascade with said first actuable filter means.

3,939,429

TUNABLE HIGH FREQUENCY INPUT CIRCUIT FOR A TELEVISION RECEIVER THAT TUNES BOTH VHF AND UHF CHANNELS AND CAN BE READILY INTEGRATED

Klaus Löhn, Johberg, Belgium; Georg Lütteke; Gerd Schiefer, both of Aachen, Germany; Lammert Bruntink, Eindhoven, Netherlands; Paulus Petrus Maria Groenewegen, Eindhoven, Netherlands; Hans Viktor Weinerth, Eindhoven, Netherlands; Wilhelmus Antonius Joseph Marie Zwijsen, Eindhoven, Netherlands, and Karel Petrus Van Rooij, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 2, 1974, Ser. No. 485,203

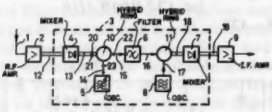
Claims priority, application Germany, July 7, 1973, 2334570

Int. Cl.² H04B 1/26

U.S. Cl. 325—432 20 Claims

1. A circuit arrangement for tuning both VHF and UHF television signals between upper and lower frequency limits, said circuit comprising a first mixer stage having a first input means for receiving said television signals, a second input, and an output means for providing a signal at a first intermediate frequency which is higher than twice said upper frequency limit; a first oscillator coupled to said second input and tunable in a range below said first intermediate frequency; a

gyromagnetic filter tuned to said first intermediate frequency and having an input coupled to said first mixer output and an output; a second mixer stage having a first input coupled to said filter output, a second input, and an output means for



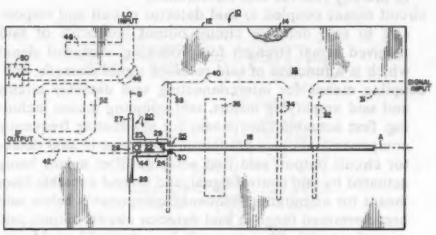
providing a signal at a second intermediate frequency lower than said lower frequency limit; and a second oscillator coupled to said second mixer second input and fixed tuned to a frequency above said first intermediate frequency.

3,939,430

INTEGRATED CIRCUIT, IMAGE AND SUM ENHANCED BALANCED MIXER

Lawrence E. Dickens, Baltimore, and Douglas W. Maki, Arnold, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1974, Ser. No. 482,671
Int. Cl.² H04B 1/26
U.S. Cl. 325—446 **13 Claims**



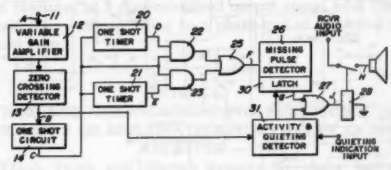
1. Microwave mixer apparatus, comprising;
a. a dielectric substrate,
b. a layer of conductor material affixed to one surface of said substrate,
c. a slot line formed in said layer of conductor material, the axis of said slot line establishing a longitudinal reference axis,
d. means for coupling a first signal at a first frequency into said slot line,
e. a coplanar strip line comprising said layer of conductor material forming a center strip aligned along said reference axis, and said layer of conductor material forming a first side conductor laterally spaced from one side of the center strip by a first longitudinal gap and forming a second side conductor laterally spaced from the other side of the center strip by a second longitudinal gap,
f. means for coupling a second signal at a second frequency into said coplanar strip line,
g. said slot line and said coplanar strip line being disposed in end-to-end relationship and at their adjacent ends cooperating to form a hybrid junction,
h. heterodyne circuit means operatively associated with said hybrid junction to derive a third signal at a frequency different from either that of the first and second frequencies,
i. means cooperative with said coplanar strip line to suppress derivation of a fourth signal at a fourth frequency different from any of the first, second and third frequencies,
j. means cooperative with said slot line to suppress derivation of a fifth signal at a fifth frequency different from any of the first, second, third and fourth frequencies,
k. said means cooperative with said coplanar strip line comprising a pair of first and second transversely aligned outwardly extending slot stubs of equal predetermined length formed in said side conductors of the coplanar strip line, said first and second slot stubs being formed at right angled appendages to the first longitudinal gap and to the second longitudinal gap, respectively, said slot stubs being formed at a longitudinal location along the coplanar strip line which is spaced from the hybrid junction end thereof by a predetermined distance,
l. said means cooperative with said slot line comprising a plurality of strips of conductor material affixed to the opposite side of said dielectric substrate, each strip of said plurality of strips passing transversely across said slot line, said plurality of strips being collectively constructed and arranged to present a relatively low impedance to said fifth frequency at said hybrid junction, and
m. said first, second, third, fourth and fifth signals are a set of signals composed of first and second input signals and related modulation product signals derived from combining the input signals in accordance with the heterodyne principle, the first, second, third, fourth and fifth signals respectively comprising a received signal, a local oscillator signal, an intermediate frequency signal, a sum frequency signal, and an image frequency signal.

3,939,431

MUTING CIRCUIT FOR A RADIO RECEIVER

Donald C. Cohlman, Rolling Meadows, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Nov. 25, 1974, Ser. No. 526,485
Int. Cl.² H04B 1/10
U.S. Cl. 325—478 **9 Claims**



1. A method of muting a radio receiver during the reception of audio frequency data or signals of a predetermined frequency, including the steps of:
a. monitoring the audio frequency signals in the receiver and providing a pulse for each zero crossing thereof;
b. using the pulses provided to produce a delayed window subsequent to each pulse, which window is delayed a period equal to the time between zero crossings of data of the predetermined frequency; and
c. comparing the occurrence of the pulses and the windows and muting the receiver for a period longer than the delay between windows each time a pulse and a window coincide.

3,939,432

FM LIMITER WITH INPUT LEVEL SENSING AND TTL LEVEL OUTPUT

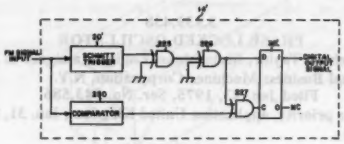
Larry Allan Nelson, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 360,519, May 15, 1973, Pat. No. 3,863,264. This application Mar. 18, 1974, Ser. No. 452,298
Int. Cl.² H03B 19/00; H03K 5/00
U.S. Cl. 328—13 **2 Claims**

1. An analog limiter with input level sensing and TTL level output, comprising:

Schmitt trigger means responsive to the amplitude of an analog signal applied thereto for providing a first square wave;

comparator means responsive to the zero crossings of an analog signal applied thereto for providing a second square wave;



means responsive to said first and second square wave for providing a data signal and a timing signal; and

means responsive to both said data and timing signals for providing an output square wave having the zero crossings of said analog signal.

3,939,433

FEEDBACK CIRCUIT

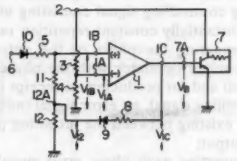
Tomoyuki Okada, Katsuta, and Seiji Suda, Mito, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 12, 1974, Ser. No. 441,856

Claims priority, application Japan, Feb. 16, 1973, 48-18266

Int. Cl.[2] H03G *3/30*

U.S. Cl. 330—25 **7 Claims**



1. A feedback circuit for use in a level detector having a comparing amplifier, means for applying a reference voltage to a first input terminal circuit of said comparing amplifier, means for applying a detected signal voltage to a second input terminal circuit of said comparing amplifier, and switching circuit connected to an output terminal circuit of said comparing amplifier and having a triggering input voltage level lower than said reference voltage, said feedback circuit comprising voltage dividing means for dividing the voltage of said second input terminal circuit to obtain a voltage lower than the triggering input voltage for said switching circuit in the region in which the voltage appearing at said output terminal circuit is lower than said triggering input voltage, and feedback means connected at one end thereof to said ouput terminal of said comparing amplifier and at the other end thereof to the voltage dividing point of said voltage dividing means.

3,939,434

WIDEBAND DC CURRENT AMPLIFIER

Philip Stephen Crosby, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 23, 1974, Ser. No. 499,824

Int. Cl.[2] H03F *3/04*

U.S. Cl. 330—40 **1 Claim**

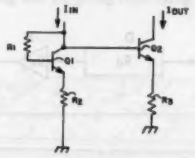
1. A current amplifier, comprising:

a first and second transistor means, each of said transistor means having a base, a collector, and an emitter;

means directly connecting the collector of said first transistor means to the base of said second transistor means, said means having a resistive value of substantially zero ohms;

first and second resistor means serially connected between the emitters of said first and second transistor means, respectively, and a reference potential;

third resistor means serially connected between the base and collector of said first transistor means, wherein the



ratio of said first resistor means to said second resistor means plus unity equals the ratio of said third resistor means to said second resistor means;

means for applying input current to the collector of said first transistor means; and

means for applying a repeated input current to the collector of said second transistor means.

3,939,435

POWER AMPLIFIER

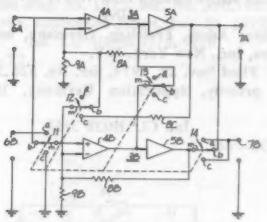
Tadao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 17, 1973, Ser. No. 397,792

Claims priority, application Japan, Sept. 21, 1972, 47-109959[U]

Int. Cl.[3] H03F *1/14*

U.S. Cl. 330—51 **11 Claims**

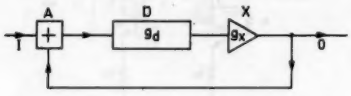


1. A power amplifier comprising; a plurality of voltage amplifying means each having at least one input terminal and an output terminal; a like plurality of signal impedance converting means, each coupled to an output terminal of a corresponding one of said voltage amplifying means; and a plurality of switching means having plural operable conditions for selectively interconnecting the input terminals of said voltage amplifying means to each other, for selectively interconnecting the output terminals of said voltage amplifying means to each other and for selectively interconnecting the outputs of said signal impedance converting means to each other, respectively, said switching means selectively establishing in a first condition, independent series circuits each comprised of a voltage amplifying means and a corresponding signal impedance converting means; in a second condition, parallel connected voltage amplifying means and signal impedance converting means; and in a third condition, balanced transformerless connections between a first voltage amplifying means and a first signal impedance converting means and a second voltage amplifying means and a second signal impedance converting means.

3,939,436
REVERBERATION DEVICE

Hans Keller, Gundelfingen, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,342
Claims priority, application Germany, Dec. 7, 1973, 2360983
Int. Cl.² H03F 3/68
U.S. Cl. 330—84 11 Claims

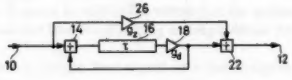


1. A reverberation device, comprising:
an input terminal;
a first adding circuit having first and second inputs and an output, the first being connected to the input terminal;
a delay line having an input and an output, said delay line having predetermined frequency dependent gain characteristics;
a compensating amplifier having an input and an output, said amplifier having frequency dependent gain characteristics corresponding to the characteristics of the delay line, said delay line and compensating amplifier being connected in series;
an output terminal, said series connected delay line and compensating amplifier being disposed between the output of the first adding circuit and the output terminal; and
a feedback line connecting the output of the series connected delay line and compensating amplifier to the second input of the first adding circuit.

3,939,437
ALL-PASS REVERBERATOR WITH AN MOS DELAY LINE

Fritz Guenter Adam, Freiburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,343
Claims priority, application Germany, Dec. 7, 1973, 2360984
Int. Cl.² H03F 3/68
U.S. Cl. 330—84 4 Claims



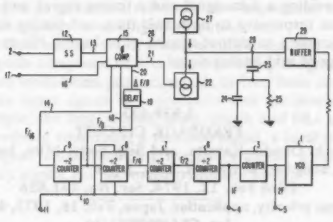
1. An all-pass reverberator, comprising:
an input terminal;
a first adding circuit having first and second inputs and an output, said first input connected to the input terminal;
an MOS delay line having an input and an output and an attenuation of g_d, said input being connected to the output of the first adding circuit;
a second adding circuit having first and second inputs and an output;
an output terminal connected to the output of the second adding circuit;
first circuit means for connecting the output of the delay line to the first input of the second adding circuit, said first circuit means having a gain of g_y;
second circuit means for connecting the output of the delay line to the second input of the first adding means, said second circuit means having a gain of g_x; and
third circuit means for connecting the input terminal to the second input of the second adding circuit, said third circuit means having a gain of g_z, wherein the gain

$$g_z = \frac{-g_d^2\, g_x g_y}{1 - g_z^2\, g_d^2}.$$

3,939,438
PHASE LOCKED OSCILLATOR

John Richard Taylor, Bishopstoke, England, assignor to International Business Machines Corporation, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,586
Claims priority, application United Kingdom, Jan. 31, 1974, 4506/74
Int. Cl.² H03B 3/04
U.S. Cl. 331—14 12 Claims



1. A phase locked oscillator comprising:
a voltage controlled oscillator arranged to be controlled by an incoming controlliing signal consisting of a stream of pulses of substantially constant repetition rate;
means for comparing the phase of the output from the voltage controlled oscillator with the phase of the controlling signal and for producing on receipt of each pulse of the controlling signal, an error signal indicative of any phase error existing between the incoming pulse and the oscillator output;
means for converting each phase error signal to a corresponding voltage and for accumulating the voltages in a store which has a predetermined decay rate, the resulting error voltage being applied to the input of the oscillator so as to reduce the phase error;
means for interrupting the oscillator output to the comparing means on detection of a phase error exceeding a predetermined amount and for resupplying the oscillator output to the comparing means in phase with a subsequent incoming control pulse, such that voltage is accumulated in the store until it is of sufficient magnitude to bring the frequency of the oscillator to the desired value to hold the phase lock.

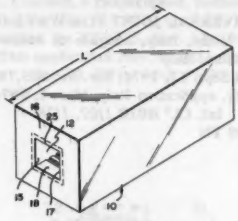
3,939,439
DIFFUSED WAVEGUIDING CAPILLARY TUBE WITH DISTRIBUTED FEEDBACK FOR A GAS LASER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Charles Elachi, Pasadena, Calif.

Filed Dec. 17, 1974, Ser. No. 533,555
Int. Cl.² H01S 3/08
U.S. Cl. 331—94.5 C 17 Claims

1. For use in a waveguide gas laser, a tube structure comprising:
an elongated capillary tube having an outer surface extending from a first end to a second opposite end of said tube, said tube further having an inner surface, defining an elongated opening extending between said ends, at least a portion of said inner surface defining corrugations along the length of said opening with a periodicity Λ, where Λ is equal to one half of a selected wavelength λ, said tube

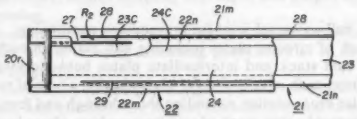
being of a material with an index of refraction definable as n_2, said tube further including a diffused region surrounding said opening with an index of refraction, definable as n_3, where $n_3 > n_2$, the depth of said diffused region around said opening, definable as d, being less than the thickness of said tube between its outer and inner surfaces.



3,939,440
WOUND RESISTOR-CAPACITOR NETWORK AND METHOD OF FORMING

Richard D. Berg, Elmhurst; Donald R. Brown, Downers Grove; Otto T. Masopust, Jr., Bolingbrook, all of Ill., and James F. Stoltz, Cape Coral, Fla., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 17, 1974, Ser. No. 533,589
Int. Cl.² H03H 7/06, 13/00; H01G 4/32; H01C 17/04
U.S. Cl. 333—70 CR 19 Claims



1. A resistor-capacitor network in the form of a roll having first and second layers of convoluted electrically conducting material separated by first and second layers of convoluted dielectric material to define a capacitance, which comprises:

first and second elongated resistance paths in said first layer of electrically conducting material extending from a lead termination area defined by said first layer of electrically conducting material at one end of the network roll, circumferentially in opposite directions to connect said lead termination area to an inwardly spaced capacitance-reforming portion of said first layer of electrically conducting material.

3,939,441
STRUCTURAL ARRANGEMENT FOR ELECTRONIC MODULES

Willi Menzel, Gauting, and Gundolf Milde, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

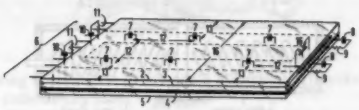
Filed Sept. 20, 1973, Ser. No. 399,259
Claims priority, application Germany, Sept. 22, 1972, 2246611
Int. Cl.² H03H 7/04, 13/00
U.S. Cl. 333—70 R 13 Claims

1. An electronic module of flat construction having a plurality of parallel strip conductors with spacing between said strip conductors being less than the width of those conductorrs, at least a pair of said strip conductors having terminals at ends thereof for connection to a source of current and being constructed to form two dimensional outgoing and incoming lines for a current supply to operating components mounted on said module comprising:

a plurality of adjacent first capacitors connected between said outgoing and incoming lines and

low pass filter means formed by pairs of said adjacent first capacitors and the segments of said incoming and outgoing lines lying between said pairs of first capacitors and formed by those of said first capacitors lying closest to any edge points of said strip conductors and segments of said incoming and outgoing lines lying between said edge points and said first capacitors lying closest to said edge points,

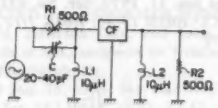
said adjacent first capacitors being spaced one from the other and the distance from edge points of said incoming and outgoing lines to said first capacitors, respectively, lying closest to said edge points being sufficiently small as to form a said low pass filter means having a greater cut off frequency than the highest frequency component of interfering voltages occurring on said incoming and outgoing lines upon operating electronic components connected to said current supply.



3,939,442
CERAMIC FILTER CIRCUIT

Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 23, 1973, Ser. No. 390,703
Claims priority, application Japan, Aug. 31, 1972, 47-87482
Int. Cl.² H03H 7/10, 9/20
U.S. Cl. 333—72 5 Claims

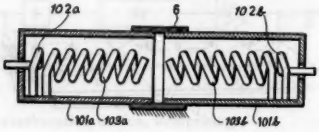


1. A filter circuit for a wide band system comprising in combination a ceramic filter element having a wide pass band, said filter element having an input and an output, first circuit means connected to said input of said ceramic filter element for decreasing the distortion factor of a wide band signal passing through said ceramic filter, said first circuit means including a resistor connected in series with said ceramic filter element and connected to the input thereof, an inductor connected to the input of said ceramic filter element and in shunt with said ceramic filter element, and second circuit means connected to said output of said ceramic filter element for decreasing the distortion factor of a signal passing through said ceramic filter element, said second circuit means including a resistor connected in series with the output of said ceramic filter element and an inductor connected to the output of said ceramic filter element and in shunt therewith.

3,939,443
FREQUENCY-SELECTIVE COUPLING FOR HIGH-FREQUENCY ELECTROMAGNETIC WAVES

Oszkár Biró; Edit Dányi; Magdolna Fenyvesi, and János Pamuk, all of Budapest, Hungary, assignors to Finommechanikai Vallalat, Budapest, Hungary

Continuation-in-part of Ser. No. 317,259, Dec. 21, 1972, abandoned. This application May 29, 1974, Ser. No. 474,157
Claims priority, application Hungary, Jan. 7, 1972, FI 506
Int. Cl.² H01P 1/20, 7/04
U.S. Cl. 333—73 R 5 Claims

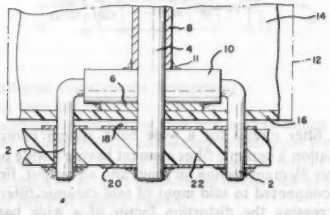


5. A frequency-selective coupling for high-frequency electromagnetic waves, comprising a pair of juxtaposed units antiresonant at a predetermined operating frequency and provided with mounting means enabling their relative rotation about a common axis, each unit including a substantially cylindrical grounded conductive shell centered on said axis with at least one open end and a central helical conductor extending generally axially within said shell, said central conductor having at least one point grounded to said shell and an ungrounded extremity spaced from said grounded point by a quarter wavelength at said operating frequency, said extremity terminating close to said open end within said shell, the shells of said units being of like diameters and confronting one another by their open ends with the corresponding extremities of their central conductors closely spaced from one another, said extremities lying in parallel planes transverse to said axes and forming a capacitive coupling variable upon relative rotation of said units.

3,939,444
PRINTED CIRCUIT MOUNTABLE, SELF GROUNDING, MULTIPLE FILTER MODULE

Robert David Hollyday, Hershey; Jack Leo Bradbery, Harrisburg, and William Jeffrey Hudson, Jr., Hershey, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 11, 1974, Ser. No. 432,739
Int. Cl.² H03H 13/00; H05K 1/12, 9/00
U.S. Cl. 333—79 4 Claims

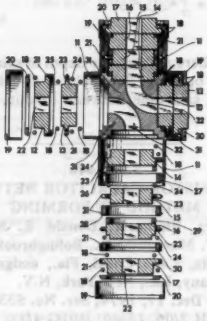


1. A filter assembly, comprising:
a header having a first ground plane thereon,
a plurality of ceramic filter elements positioned in side-by-side relation overlying said first ground plane,
electrical leads on said filters projecting outwardly through said header,
a second ground plane normal to said first ground plane and electrically engaged upon and overlying said filters,
a printed circuit board having a ground plane thereon, and
electrically conducting pins connected to said frist and said second ground planes and projecting through said header for pluggable connection to the ground plane of said printed circuit board.

3,939,445
BALL UNIVERSAL JOINT FOR WAVE GUIDES

Mario Liguori, Milan, Italy, assignor to Messrs Elettronica Aster S.r.l., Milan, Italy

Filed Sept. 13, 1974, Ser. No. 505,791
Claims priority, application Italy, Mar. 1, 1974, 48874/74
Int. Cl.² H01P 1/02, 1/28
U.S. Cl. 333—98 TN 3 Claims



1. A ball universal joint for waveguides comprising:
a stack of circular plates including end plates on each end of said stack and intermediate plates between said end plates, each of said circular plates having a hole of rectangular cross-section extending therethrough and forming a waveguide step, each of said intermediate plates having a thin peripheral portion with a plurality of cylindrical holes extending therethrough arranged in a circular ring around the axis of its respective intermediate plate, the diameters of said circular rings on adjacent intermediate plates being different from each other;
a rigid body positioned between two of said intermediate plates and having at least one pair of end surfaces lying in planes at 90° to each other and facing respective ones of said two intermediate plates, said rigid body having at least one curved hole of rectangular cross-section extending between said two end surfaces and forming a curved waveguide step;
a rigid framework fast with said body and coupled to said end plates to hold said circular plates and said body in stacked compressed relation one on another;
rings of end balls between said framework and said end plates for axially coupling said framework to said end plates while permitting axial rotation of said circular plates;
rings of peripheral balls between the outer circular periphery of said circular plates for radially coupling said framework to said circular plates while permitting axial rotation of said circular plates;
an intermediate plate ball located in each of said cylindrical holes, said intermediate plate balls having substantially the same diameter as said cylindrical holes but having a larger diameter than the thickness of its respective thin peripheral portion; and
at least one rigid ring between adjacent ones of said circular plates, said ring abutting one of said adjacent plates and said intermediate plate balls in the cylindrical holes of the other of said adjacent ones of said circular plates.

3,939,446

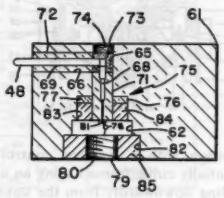
MILLIMETER WAVE TRANSLATING DEVICE WITH CHANGEABLE INSERT ELEMENT

Theodore L. Kozul, 19 Wright Ave., Medford, Mass. 01757, and Paul A. Crandell, 6 Parker Road, Bedford, Mass. 01730

Continuation of Ser. No. 245,930, April 20, 1972, which is a division of Ser. No. 875,755, Nov. 12, 1969, Pat. No. 3,681,718. This application Nov. 1, 1973, Ser. No. 411,798

Int. Cl. H01p *1/00, 11/00*

U.S. Cl. 333—98 R 5 Claims



1. In a high frequency wave translating device including an input waveguide transmission line structure designed for conducting millimeter waves and an output coaxial transmission line structure, means coupling said input and output structure comprising,

a housing which contains the input waveguide structure,

a slot in the housing extending perpendicular to the input waveguide,

an electrically conductive flat plate insert which fits into the slot and contains the output coaxial line structures,

an opening through the plate transverse to the plane thereof, in registration with and forming a continuation of the input waveguide,

a wave translating element mounted in said opening for coupling electrically with both the input and output structures by electrically connecting to the waveguide and to the center conductor of the coaxial line, and

a high frequency wave choke defined by a coaxial cavity in the plate adjacent the opening between the opening and the output coaxial line structure, concentric with and along said output line for preventing millimeter waves conducted by the input structure from being conducted to the output structure,

an electrically conductive ring plug in the coaxial cavity completing the choke coaxial cavity and partially defining the plate opening and

an electrically conductive window plug in an edge of the plate completing the plate opening.

3,939,447

SPRING MOUNT FOR A CATHODE RAY TUBE YOKE

Ralph James D'Amato, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 7, 1975, Ser. No. 539,107

Int. Cl.² H01F *7/00*

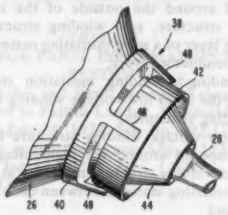
U.S. Cl. 335—210 5 Claims

1. A yoke mount for a cathode-ray tube comprising,

a first portion adapted for receiving a yoke,

a second portion adapted for connection to a cathode-ray tube, and

a plurality of springs interconnecting said first and second portions, said springs providing the sole support of said first portion relative to said second portion, said springs being bendable to accomodate alignment of a yoke with a cathode-ray tube.



3,939,448

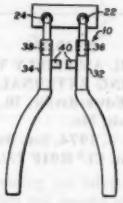
MECHANICAL MAGNETS OF MAGNETOSTRICTIVE, REMANENT, CIRCULARLY MAGNETIZED MATERIAL

Ivan J. Garshelis, 61 Oleander Way, Clark, N.J. 07066

Filed July 12, 1974, Ser. No. 488,841

Int. Cl.² H01F *7/20;* H01H *55/00*

U.S. Cl. 335—215 13 Claims



1. A mechanical magnet, comprising a rod of magnetostrictive, remanent, circularly magnetically anisotropic, circularly magnetized material, and means for twisting said rod, whereby to alter said circular anisotropy to helical anisotropy and thus reorient the circular magnetic field to a helical field with an axial component.

3,939,449

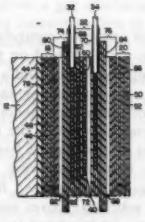
INSULATED TRANSFORMER WINDINGS

Edward L. Boyd, Jefferson City, and John P. McInerney, Hartsburg, both of Mo., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 15, 1975, Ser. No. 541,368

Int. Cl.² H01F *27/08, 27/32*

U.S. Cl. 336—60 4 Claims



1. A transformer comprising;

a magnetic core structure;

an inner low-voltage winding structure having conductor layers disposed in inductive relationship with the magnetic core, said winding structure including at least one

layer of a solid insulating material between each of said conductor layers;

a high-voltage winding structure having conductor layers disposed around the outside of the inner low-voltage winding structure, said winding structure including at least one layer of a solid insulating material between each of said conductor layers;

a first winding-to-winding insulation structure disposed between the inner low-voltage winding and the high-voltage winding structures;

an outer low-voltage winding structure having conductor layers disposed around the high-voltage winding structure, said winding structure including at least one layer of a solid insulating material between each of said conductor layers; and

a second winding-to-winding insulation structure disposed between the high-voltage winding and the outer low-voltage winding structures;

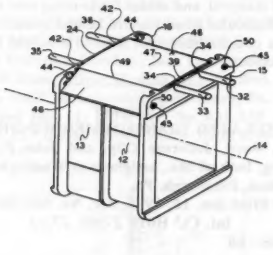
said first and second winding-to-winding insulation structures each having ducts which permit the flow of liquid dielectric through the insulation structure, having layers of a solid insulating material which extend axially beyond the axial ends of all of the layered insulating material in all of said winding structures, and not having a conventional metallic foil electrostatic shield which extends substantially the entire axial length of the high-voltage winding structure.

3,939,450

ELECTRICAL COIL ASSEMBLY WITH MEANS FOR SECURING EXTERNAL LEADS

Donald E. Donnelly, Edwardsville, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 4, 1974, Ser. No. 512,066
Int. Cl.² H01F 27/30
U.S. Cl. 336—90 **4 Claims**



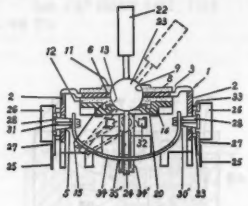
1. An electrical coil assembly comprising a bobbin having a pair of end flanges, a coil wound on said bobbin between said flanges and having a start end and a finish end, insulated external leads, means for connecting said insulated leads at their ends to said coil ends intermediate said flanges, said connecting means being secured to the inside wall of one of said flanges, the other of said flanges having slot means open to a peripheral edge thereof receiving therein an insulated portion of said insulated leads spaced from their connected ends, relatively rigid insulative cover means attached to said flanges and overlying said insulated leads adjacent said slot means for confining said insulated leads within said slot means, said cover means also extending between said flanges and overlying said connecting means thereby insulatingly covering said connecting means, and interengaging means on said cover means and on said flanges for providing snap-on attachment therebetween.

3,939,451

BALANCE CONTROL FOR USE IN 4-CHANNEL STEREOPHONIC SYSTEM

Masao Kasahima, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1973, Ser. No. 341,918
Claims priority, application Japan, Sept. 6, 1972, 47-89316
Int. Cl.² H01C 9/00
U.S. Cl. 338—128 **4 Claims**



1. In combination with a balance control of the type wherein a substantially cubic frame having an upper wall and side walls extending downwardly from the upper wall is provided with a plurality of variable resistors provided with rotary shafts fixed to the side walls, the rotary shafts extending inwardly into the frame, ganging strips secured to the rotary shafts, each of the ganging strips in the shape of an arc and having a longitudinal slot, an operation rod provided with a ball, the ball mounted on the upper wall, the operating rod being inserted through the slots of the ganging strips to move the strips and thereby rotate one or more of the rotary shafts of the variable resistors, the improvement which comprises:

a. the opposite ends of each of the ganging strips provided with holes, the holes of each ganging strip being of a size different from the holes of the other remaining ganging strips;

b. the end portion of each of the rotary shafts being inclined so as to be smaller toward its outer end;

c. the ganging strips being secured to the rotary shafts by inserting the end portion of the rotary shafts into the holes of the ganging strips to the extent allowed by the size of the hole, whereby the radius of the arc of each ganging strip will be determined by the size of the hole of the ganging strip thereby permitting each ganging strip to have an arc of a different radius so that the ganging strips do not come into physical contact with each other although the end portions are the same.

3,939,452

DESK-TOP ELECTRONIC COMPUTER WITH MOS CIRCUIT LOGIC

Gian Franco Faggian, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

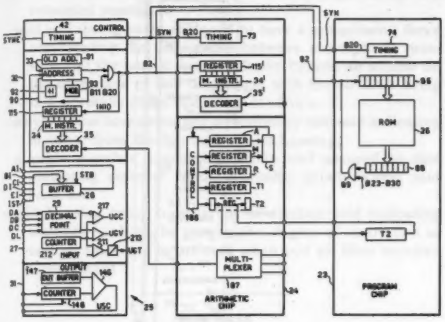
Filed July 11, 1973, Ser. No. 378,354
Int. Cl.² G06F 15/20, 13/00, 9/06, 9/16
U.S. Cl. 340—172.5 **10 Claims**

1. In a desk-top electronic computer disposed on at least three semiconductor chips:

input-output means disposed on at least the first of the three semiconductor chips for receiving data signals applied thereto and for feeding data signals therefrom to the remaining semiconductor chips;

processing means receptive of data signals fed from said input-output means for processing the data signals, said processing means including arithmetic means disposed on the second semiconductor chip and receptive of data signals from said input-output means for performing arithmetic operations thereon, a memory instruction register and a memory address register both disposed on the first semiconductor chip, control means disposed on the third semiconductor chip and receptive of data signals

from said input-output means for controlling the arithmetic means to perform selected arithmetic operations and comprising a read-only memory having addressable microinstructions stored therein and circuit means disposed on the three semiconductor chips for transferring over a first single signal conductor between the three semiconductor chips both the data signals from the memory address register to address the read-only memory and the data signals of the addressed microinstruction from the read-only memory to the memory instruction register; and

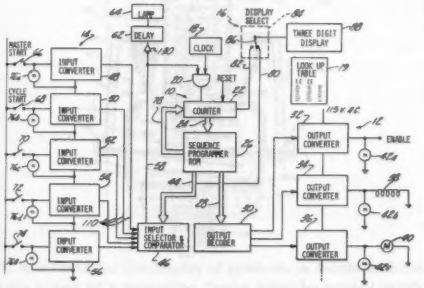


timing means disposed on the three semiconductor chips and interconnected by a second single signal conductor for synchronizing the data signal flow on the three semiconductor chips.

3,939,453
DIAGNOSTIC DISPLAY FOR MACHINE SEQUENCE CONTROLLER

Roger L. Schroeder, Springfield, Vt., assignor to Bryant Grinder Corporation, Springfield, Vt.

Filed Apr. 29, 1974, Ser. No. 465,334
Int. Cl.² G06F 15/46
U.S. Cl. 340—172.5 **22 Claims**

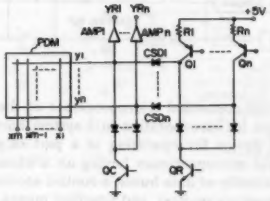


1. In a sequence controller and diagnostic display system for a machine having means for performing a plurality of controlled functions in a cycle of programmed steps: means for producing a sequence of signals representing increments of advancement from one of said steps to another; sequence programmer means including data storage means connected to receive said signals for intermittently producing in response to each said signal a plurality of input codes defining known machine conditions to be met before performing subsequent steps and digital cycle step commands defining machine steps to be performed sequentially; means for advancing the means for producing said sequence of signals only as said machine conditions are met; and display means connected to selectively display coded digital representations of said cycle step commands and input codes as they are produced.

3,939,454
GAS DISCHARGE PANEL INFORMATION READ-OUT SYSTEM

Shizuo Andoh, Kobe, and Kenji Murase, Kakogawa, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed July 30, 1974, Ser. No. 493,124
Claims priority, application Japan, Aug. 3, 1973, 48-87404
Int. Cl.² G11C 7/00, 11/28
U.S. Cl. 340—173 PL **5 Claims**



1. A method for reading out information from a gas discharge panel having first and second sets of plural electrodes each, each said set being covered with an insulating layer and disposed in spaced relation from the other to define a gas discharge space therebetween and containing a gaseous medium within the said space, the electrodes of said first and second sets being disposed to intersect one another and thereby define discharge cells at the respective intersections of individual electrodes of said first and second sets and including a plurality of unidirectional conducting devices connected in circuit with respectively associated ones of said electrodes of said first set, information being stored in said panel as selectively established discharges in said cells and producing a wall charge in association with each information storing cell, said method comprising

producing a forward current flow in each of said unidirectional conducting devices to store an electric charge in each thereof,

applying a read voltage to each of said electrodes of said first set to produce a gas discharge in said cells and to cause a charging current to flow in the electrodes of said first set in a backward direction through said unidirectional conducting charge storage devices and of a level in accordance with the backward recovery time of the unidirectional conducting charge storage devices to terminate further backward conduction thereof,

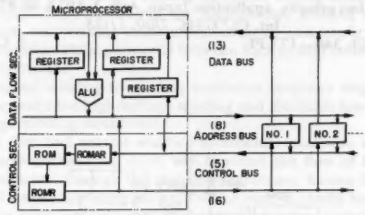
an information storing discharge cell, following the termination of the backward direction charging current, producing a gas discharge current in accordance with the wall charge therein and causing a potential change in the electrode of said first set associated with the said information storing discharge cell, and

detecting selectively, a potential change of an electrode of said first set occurring due to the gas discharge current thereby to read out the information stored in an information storing discharge cell associated with the said electrode of said first set.

3,939,455
MICROPROCESSOR HAVING AN INTERFACE FOR CONNECTION OF EXTERNAL DEVICES

Koki Toyosawa, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Continuation of Ser. No. 293,051, Sept. 28, 1972, abandoned.
This application Sept. 10, 1974, Ser. No. 504,703
Claims priority, application Japan, Oct. 1, 1971, 46-76311
Int. Cl.² G06F 9/00
U.S. Cl. 340—172.5 1 Claim



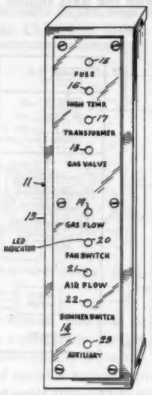
1. A program-controlled microprocessor of the microprogramming type for incorporation in a system having at least one external device for operating as a part of said microprocessor, said microprocessor having an arithmetic section including a plurality of data buses, a control section including a read-only-memory register, and interface means connecting said microprocessor to said at least one external device, said interface means comprising data bus means including at least predetermined ones of said plurality of data buses of said arithmetic section of said microprocessor, control bus means connecting said read-only-memory register with said at least one external device and for providing outputs from said read-only-memory register indicative of microprogramming instructions to said at least one external device, and address bus means connecting said control section of said microprocessor with said at least one external device, said address bus means being responsive to an output of said at least one external device for supplying the output to said control section of said microprocessor whereby the output of said at least one external device designates an address of the next microprogramming instruction to be executed, the output of said at least one external device being provided in response to a microprogramming instruction supplied through said control bus means to said at least one external device.

3,939,456
HEATING PLANT MONITOR SYSTEM

Thomas W. Curtis, and Roger M. Bresnahan, both of Toledo, Ohio, assignors to Curtis International, Inc., Toledo, Ohio

Filed Dec. 9, 1974, Ser. No. 530,822
Int. Cl.² G08B 25/00
U.S. Cl. 340—213 R 10 Claims

1. A visual monitor device for monitoring predetermined components in an operating system, at least some of such monitored components being dependent upon the other monitored components functioning normally, said device comprising, in combination, a visual display panel including a plurality of selectively energizable indicators positioned on said panel, a printed indicia associated with each of said indicators which identifies the system component monitored by each indicator, electrical power supply means connected to said indicators for maintaining all of said indicators in a first state of energization when all system components are in normal operation, a plurality of component sensing means for sensing the operating condition of each system component to be monitored, means connecting each of said sensing means to the correspondingly labeled indicator and to said power supply for causing in the event of a sensed malfunction of one component (a) its correspondingly labeled indicator to shift to a second state of energization and (b) other indicators to shift to said second state if their corresponding monitored components are dependent upon normal operation of said one component, and wherein said plurality of indicators are positioned on said panel in a prearranged linear sequence wherein the malfunction of a

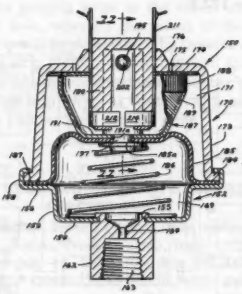


given component effective to shift the state of energization of its corresponding indicator will likewise shift the state of energization of said other indicator lights which are all subsequent in such prearranged sequence to the given corresponding indicator.

3,939,457
AIR FILTER RESTRICTION INDICATING DEVICE

Richard Donald Nelson, 711 River St., Decorah, Iowa 52101

Filed Nov. 7, 1974, Ser. No. 521,697
Int. Cl.² G08B 21/00
U.S. Cl. 340—239 F 2 Claims



1. An air filter restriction indicating device, having in combination

a housing having a top and bottom wall, and having an air filter in connection therewith,

an inverted upstanding cup-shaped diaphragm having an upwardly disposed end wall,

a flange secured about the open end portion of said diaphragm,

means securing said flange to said housing thereabout,

a flared cup shaped indicating member upstanding from said end wall of said diaphragm and secured thereto, said member bearing indicia upon its outer wall indicating the condition of restriction of said filter,

apertures through said housing at one side of said diaphragm for communication of said indicating member with the atmosphere,

a passage at the other side of said diaphragm through said housing communicating with the air stream passing from said air filter to an internal engine,

a tapered helical coil spring upstanding from the bottom wall of said housing holding said diaphragm in upward extended position,

said coil spring being arranged to have a compressive force representing the differential between atmospheric pressure and the partial vacuum drawn by said air stream on the other side of said diaphragm with the air filter being in a normally clean operating condition,

a cylindrical boss extending downwardly into said indicating member from the top wall of said housing,

a guide member upstanding within and secured to said indicating member freely moveable axially within said boss, and

said housing being transparent to disclose said indicating member to show the progressive degree of restriction in said air filter and to indicate when said air filter requires replacement.

3,939,458

METHOD FOR THE TABULATOR-LIKE ILLUSTRATION OF SYMBOLS

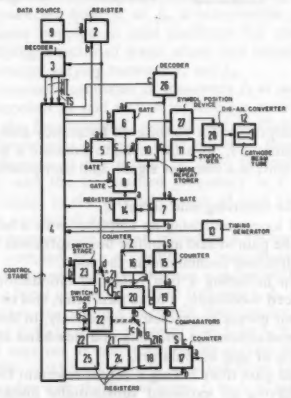
Rudolf Kuntze, Otterfing, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 7, 1974, Ser. No. 431,420

Claims priority, application Germany, Jan. 10, 1973, 2301104

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 A **13 Claims**



1. A method for the display of symbols, in tabulated form, on the screen of a data-video device whereby symbol words, corresponding to the symbols, are released by a data source, and display of the symbols effected by utilization of an image repetition store and a symbol generator, comprising the successive steps of:

I. inserting a writing mark word from the data source in the image repetition store and displaying a writing mark corresponding to the writing mark word upon the picture screen,

II. inserting an order word tabulator set from the data source in the form of a tabulator word, into that cell of the image repetition store in which the previously inserted writing mark word was stored,

III. continuously supplying data from the picture repetition store to the symbol generator whereby the latter provides symbols and a tabulator mark corresponding to the tabulator word, to the picture screen for display thereon,

IV. feeding an order word tabulator advance from the data source, and with utilization of a decoded ascertaining the location in the image repetition store of the next tabulator mark, and thereafter displaying a writing mark in the corresponding column so ascertained.

3,939,459

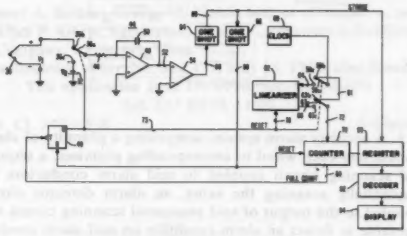
DIGITAL SIGNAL LINEARIZER

Howard S. Hoopes, Hatfield, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Jan. 9, 1974, Ser. No. 432,130

Int. Cl.² H03K *13/02, 13/20*

U.S. Cl. 340—347 NT **2 Claims**



1. A digital signal linearizer comprising:

a programmable pulse rate multiplier for receiving an input pulse train whose total pulse count represents the value of a particular variable and has a non-linear relationship to the value of said variable, said multiplier being operable in accordance with a control signal to produce from said input pulse train an output pulse train at an instantaneous pulse rate which is a predetermined multiple of the instantaneous pulse rate of said input pulse train, and

a counter-decoder operable to count the pulses of said input train and supply in response to the progression of said count through successive predetermined ranges to the total count a control signal for each of said ranges for programming said multiplier to provide over each of the ranges a predetermined linear relationship between the number of pulses supplied to the output train and the corresponding change in value of said variable, said counter-decoder including:

a first resettable binary counter for counting the pulses of said input pulse train and for producing on the output lines from its separate stages binary states representing the selectable spans of said successive ranges following the reset of said first counter,

gating means for selectively gating signals from said output lines in response to gating signals to select said successive ranges,

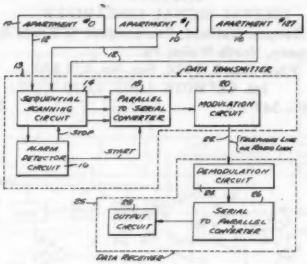
a second binary counter reset simultaneously with said first counter and operable to count said gated signals for producing on the output lines from its separate stages a binary address indicative of the count of the number of said successive ranges following reset passed by the input pulse train, and

decoding means connected to the output lines of said second counter and responsive to said binary address to produce said gating signal on output lines to said gating means for selecting said successive ranges and to produce said control signal for each of said successive ranges as required to establish the necessary multiple for said pulse rate multiplier to provide said desired predetermined linear relationships over each of said ranges.

3,939,460
SECURITY ALARM SYSTEM

Barry N. Horn, Milwaukee, Wis.; Richard S. Swain, Des Plaines, Ill., and Richard C. Rice, Milwaukee, Wis., assignors to Barry N. Horn, Milwaukee, Wis.

Filed Apr. 24, 1974, Ser. No. 463,713
Int. Cl.[2] G08B 25/00, 26/00
U.S. Cl. 340—408 7 Claims

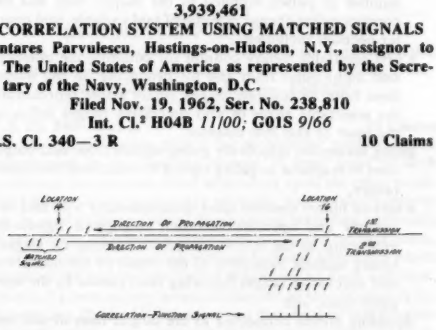


1. A security alarm system comprising a plurality of alarm conductors each wired to corresponding premises, a sequential scanning circuit coupled to said alarm conductors for sequentially scanning the same, an alarm detector circuit coupled to the output of said sequential scanning circuit and operable to detect an alarm condition on said alarm conductors as they are scanned, a parallel to serial converter coupled to said sequential scanning circuit, means for initiating the operation of said parallel to serial converter when an alarm condition is detected on one of said alarm conductors, means for transmitting the output of said parallel to serial converter to a remote location, means in said remote location for receiving the transmitted data, a serial to parallel converter in said remote location for translating the received data from serial to parallel form, and an output circuit coupled to the output of said serial to parallel converter for utilizing the received data, said transmitting means including a voltage controlled oscillator coupled to the output of said parallel to serial converter, and further comprising a frequency divider counter coupled to the output of said voltage controlled oscillator, the output of said frequency divider counter being coupled to said parallel to serial converter and serving as clock pulses therefor.

3,939,461
CORRELATION SYSTEM USING MATCHED SIGNALS

Antares Parvulescu, Hastings-on-Hudson, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 19, 1962, Ser. No. 238,810
Int. Cl.[2] H04B 11/00; G01S 9/66
U.S. Cl. 340—3 R 10 Claims



1. A method for reconstituting a signal which must be propagated between two points in a bounded physical medium so that an approximation of said signal is recoverable comprising the steps of:

propagating said signal from one point to another point within said bounded medium;

receiving the propagated signal at said other point;

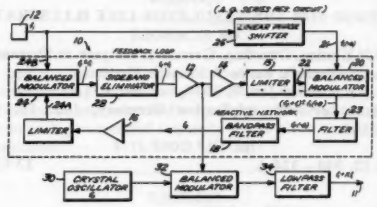
reversing said received signal with respect to time so that it constitutes a signal matched to the characteristic response of the bounded medium between said two points; and

propagating said matched signal through said bounded physical medium from one of said points when a signal approximating said originally propagated signal is desired at the other of said points.

3,939,462
DOPPLERIZING A SIGNAL OF VARYING FREQUENCY

Claude C. Routh, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 28, 1966, Ser. No. 605,498
Int. Cl.[2] G01S 9/66; G09B 9/00
U.S. Cl. 340—3 E 1 Claim



1. A transponder for shifting all frequancy components of signal frequency, f_i, by a factor K, to simulate a true doppler frequency shift in a complex signal, said transponder comprising;

means for receiving said signal, f_i,

a closed loop comprising an amplifier with a feedback circuit, the gain of said amplifier being sufficient to generate self-sustained oscillations in the loop,

said loop including a first balanced modulator, a second balanced modulator, a band pass filter, and two side band selector means connected, respectively, in the outputs of said modulators for selecting one side band at the output of each of said modulators,

said band pass filter having a center resonant frequency, f_p, and having an extended substantially linear phase-frequency characteristic extending above and below the zero phase at said resonant frequency,

a linear phase shifter,

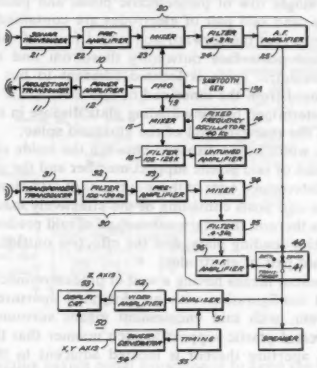
means for applying said signal, respectively, to said first balanced modulator, and to said second balanced modulator, the signal circuit to said second modulator including said linear phase shifter so that the phase of the selected side band at the output of said second modulator shifts as the frequency f_i shifts, so that the reactive network of said band pass filter will shift the frequency of oscillation, f_p, of said loop as the frequency of said input signal f_i is shifted to kf_i, and

means for extracting the frequency $f_i + kf_i$ in said loop comprising a fixed frequency oscillator of frequency f_o equal to said center frequency, f_p, of the band pass filter and means for adding said f_o to $f_i + f_i$ in said loop to yield true doppler frequency shift, $f_i + kf_i$.

3,939,463
ACOUSTIC TRANSPONDER NAVIGATION SYSTEM

Neil C. Kelly; Robert L. McFarland, both of San Diego, and Jack W. Sampsell, National City, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 5, 1964, Ser. No. 342,833
Int. Cl.² G01S 9/68
U.S. Cl. 340—3 E 1 Claim



1. In combination in an acoustic obstacle detection and navigating system;

a transmitting station comprising a variable frequency oscillator, a sawtooth generator coupled to said oscillator for sweeping the frequency of oscillations through the range of frequencies from f_1 to f_2, a submersible projection transducer coupled to said oscillator for continuously ensonifying a sector of water about said transducer with sonic energy varying between f_1 and f_2,

a fixed frequency oscillator of frequency f_2 at said station,

a sonar receiver at said station including a mixer for combining the frequencies f_1 to f_2 of said oscillator with the echo frequencies reflected from a passive target, so that the difference at any instant between the reflected frequency and the transmitted frequency is a frequency proportional to the rate of change of said variable frequency and target range,

a remote transponder station including a receiving hydrophone coupled to a transmitting transducer, a mixer coupled between said hydrophone and transmitting transducer, a local oscillator of fixed frequency, f_3, coupled to said mixer for shifting received frequencies from the range of f_1 to f_2, to the range of $f_1 + f_3$ to $f_2 + f_3$, and

a second receiver at said transmitting station including a mixer for combining signals repeated from said remote transponder with the frequencies, f_1 to f_2 of said variable oscillator displaced by the frequency f_3, of said fixed frequency oscillator, and a common display for both mentioned receivers.

3,939,464
COAXIAL CABLE SENSOR MOUNTING

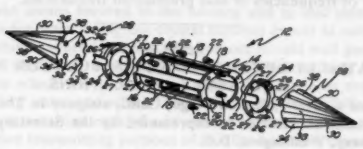
Richard C. Swenson, North Stonington, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1974, Ser. No. 520,501
Int. Cl.² H04R 1/44
U.S. Cl. 340—4 R 8 Claims

1. A sensor mount comprising:

a sensor cage having a cylindrical shape with a split ring at both ends and a plurality of grooved strongbacks connected there between; and

conically shaped flexible fairings connected at both ends of said sensor cage and each of said fairings having grooves

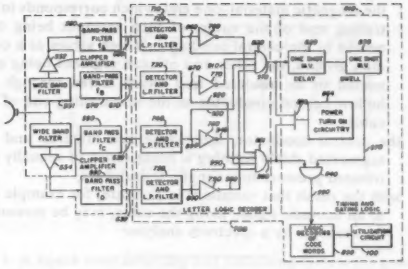


aligned with the strongback grooves and at least one additional groove having an aperture at the base of said fairing.

3,939,465
REMOTE UNDERWATER DEVICE ACTIVATING SYSTEM

Robert A. Helton; George M. Walsh, both of Middletown, and Allan P. Alarie, Barrington, all of R.I., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 824,477, May 14, 1969, abandoned.
This application June 15, 1970, Ser. No. 48,891
Int. Cl.² H04B 11/00
U.S. Cl. 340—5 R 5 Claims



1. Apparatus for activating a submerged device, the apparatus comprising:

detecting means responsive to incident acoustic waves which communicate a succession of signal pulses for detecting said signal pulses to provide signal indications of the presence or absence of predetermined frequencies therein;

a logic arrangement coupled to said detecting means for the coding only those signal indications manifesting a joint presence of certain preselected frequencies and the absence of other preselected frequencies, said logic arrangement further including means responsive to successive decoded signal indications, said logic arrangement including a delay means and a gate responsive to said delay means to permit activation of said submerged device only if a second one of said signal indications occurs a predetermined time after the occurence of a first one of said signal indications; and

said detecting means further comprising a first wideband filter for passing a first of said present preselected frequencies and a second wide band filter for passing a second of said present preselected frequencies, and a first and a second limiting means coupled respectively to said first wide-band filter and said second wide-band filter, the output of said first limiting means being coupled to a pair of band-pass filters tuned to a pair of said preselected

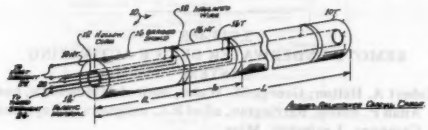
frequencies, said second limiting means being coupled to a second pair of band-pass filters tuned to a second pair of frequencies of said preselected frequencies.

3,939,466

SPATIALLY DISTRIBUTED TRANSDUCER FOR TOWED LINE ARRAY APPLICATIONS

Tibor G. Horwath, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1975, Ser. No. 543,749
Int. Cl.[2] G01V *1/38, 1/16*
U.S. Cl. 340—7 R 6 Claims



1. A coaxial cable, suitable for use in a towed line array, with one end trailing in the water when in use, comprising:

a central, flexible, hollow, metallic conductor;

a magnetizable, plastic, material, which is azimuthally magnetized to saturation before being put into use, surrounding the central conductor;

a segmented shield, consisting of N segments, surrounding the magnetic material, one end, which corresponds to the trailing end of the cable, of each segment being connected to the central conductor, which serves as a common ground, the other end of each segment being connected to an insulated lead which is fed through the hollow central conductor to the non-trailing end of the cable;

the central conductor, the magnetized material and the segmented shield forming a linear series of spatially distributed pressure-to-magnetic transducers;

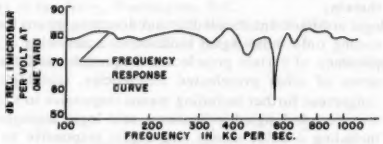
with the result that variations in pressure, for example due to an acoustic signal, along the cable, may be measured, for example by a spectrum analyzer.

3,939,467

TRANSDUCER

Rufus L. Cook, and Henry L. Warner, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1974, Ser. No. 458,960
Int. Cl.[2] H04B *13/00*
U.S. Cl. 340—8 R 1 Claim



1. A tunable electroacoustical transducer system adapted for broadcasting acoustical energy to and receiving acoustical energy from an aqueous environmental medium, comprising in combination:

a plurality of piezoelectric posts, each of which has an active forward end face for broadcasting and receiving acoustical energy to and from the aforesaid aqueous environmental medium, each of which has a rearward end, each of which is spatially disposed from adjacent ones thereof, and all of which are disposed in a single row of predetermined configuration with predetermined successively decreasing lengths from one end of said row to the other;

a piezoelectric spine, with the forward end thereof integrally connected to the rearward end of each of said piezoelectric posts;

a pair of electrodes connected to predetermined surfaces of said plurality of piezoelectric posts and said piezoelectric spine for receiving electrical energy therefrom and supplying electrical energy thereto;

a plastic support member having a slot therein within which said single row of piezoelectric posts, and piezoelectric spine, and said pair of electrodes are contained in such manner that the forward active end faces of said piezoelectric posts face outwardly therefrom and that said piezoelectric spine is located adjacent to but spatially disposed from the inner end of said slot;

a predetermined backing-loading plate dispose in abutment with the rearward end of the aforesaid spine;

a balsa wood frame disposed between the inside surface of the slot of said plastic support member and the outside of predetermined ones of those surfaces of said piezoelectric spine and posts consisting of the effectively inactive surfaces thereof, the rearward surface of said predetermined backing-loading plate, and the effective outside surfaces of said pair of electrodes;

encasement means having a wall of predetermined geometrical configuration with an elongated aperture located therein, with said encasement means surrounding the aforesaid plastic support in such manner that the aforesaid aperture thereof is located adjacent to the active forward end faces of said plurality of piezoelectric posts;

an acoustically clear plate means located within the end of and connected to said balsa wood frame in contiguous disposition with the active forward end faces of said plurality of piezoelectric posts for passing acoustical energy therethrough;

means connected to said encasement means for the mounting thereof on a predetermined platform;

a plurality of acoustically opaque shutters hinged to said encasement means in such manner that each one thereof may be rotated to effect the closure of predetermined portions of the aforesaid elongated aperture, thereby effectively inactivating predetermined ones of said single row of piezoelectric posts while permitting activation of the remaining ones thereof;

means connected to said plurality of acoustically opaque shutters for effecting the rotation thereof in such manner as to cause the timely opening and closing of predetermined portions of the aforesaid elongated aperture in accordance with a predetermined program, so as to permit the playing of the aforesaid tunable electroacoustical transducer system in accordance with said predetermined program; and

a sonar system connected to said pair of electrodes.

3,939,468

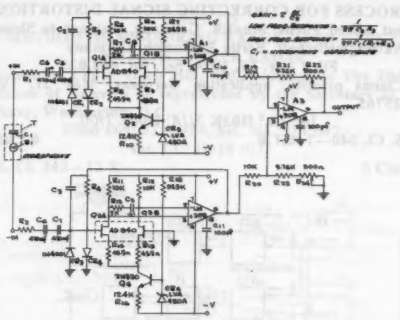
DIFFERENTIAL CHARGE AMPLIFIER FOR MARINE SEISMIC APPLICATIONS

Robert H. Mastin, Dallas, Tex., assignor to Whitehall Corporation, Richardson, Tex.

Filed Jan. 8, 1974, Ser. No. 431,723
Int. Cl.[2] G01V *1/00*
U.S. Cl. 340—7 29 Claims

1. A marine hydrophone assembly for an elongated streamer designed to be towed underwater for passive underwater sound detection of acoustic pressure variations and the like, comprising a marine hydrophone of the capacitive transducer type responsive to varying acoustic pressure to produce a varying electrical charge output that is proportional to the acoustic pressure to which the hydrophone is subjected, an electrical conductor pair connected to the hydrophone to conduct the output from the hydrophone to signal processing equipment spaced therefrom, and a differential charge ampli-

fier connected to the pair of conductors to respond to the varying electrical charge output from the hydrophone and produce amplified output voltage signals representative of said varying electric charge output, the differential charge amplifier comprising a pair of amplifier circuits each having negative and positive polarity inputs and an output arranged to form a pair of charge amplifier stages, each including a paralleled resistance-capacitance combination connected from the outputs of each of the respective amplifier circuits to the respective negative input thereof forming negative feed-



back circuits having equal capacitance to keep the two inputs of each respective amplifier circuit at the same potential, means connecting the pair of conductors respectively to the negative polarity inputs of the two respective amplifiers to feed said varying electric charge output thereto, and a differential amplifier having negative and positive polarity inputs and means connecting the outputs from said two charge amplifiers to said last-mentioned inputs for cancelling common mode signals appearing at the negative polarity inputs of said two charge amplifiers.

3,939,469

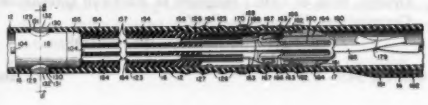
DETECTION STREAMER

Robert H. Park, Bernardsville, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 526,624, March 15, 1944. This application Dec. 29, 1944, Ser. No. 570,227

Int. Cl.² G01V *1/38*

U.S. Cl. 340—10 **4 Claims**



2. In combination with an air-filled flexible tube having two diametrically disposed wall portions adapted to transmit vibrations and sealed at both ends whereby it may be immersed in water, a hydrophone having a substantially uniform dumbbell shaped response pattern, comprising a rigid sleeve member within said flexible tube and arranged to support a portion of said tube throughout its circumference, said rigid sleeve member having two diametrically disposed openings adjacent said vibration transmitting portions of said tube, a substantially moisture-proof housing formed integrally with said sleeve member and extended thereacross between said two openings therein, piezo-electric crystal element means disposed within said substantially moisture-proof housing with both the signal sensitive end faces thereof respectively arranged in predetermined spaced relation with respect to the vibration transmitting wall portions of said tube, resilient means for mounting said piezo-electric element means within said housing without introducing variations in the transverse static loading thereof, resilient means secured to the housing and to said mounting means for maintaining the crystal element means in said predetermined spaced relation with respect to said wall portions of the tube, and a quantity of vibration transmitting liquid therein which has the same acoustic impedance as the surrounding water and which fills said housing for coupling the pressure sensitive ends of said crystal element means to said vibration transmitting portions of said flexible tube, said vibration transmitting liquid being inserted in the housing under pressure which exceeds the pressure of the air in said tube thereby to prevent air pockets in said liquid and to avoid azimuthal variations in the dumb-bell shaped response pattern of the hydrophone.

3,939,470

LIQUID LEVEL DETECTING AND INDICATING SYSTEM FOR VEHICLE

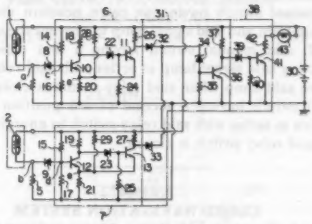
Hiroshi Arai; Jun Ohta, both of Toyota; Koichi Taniguchi; Yasuhiko Sakurai, both of Kariya, and Toshikazu Ohtake, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 5, 1974, Ser. No. 439,770

Claims priority, application Japan, Feb. 8, 1973, 48-15879

Int. Cl.² G08B *21/00*

U.S. Cl. 340—59 **7 Claims**



1. A liquid level detecting and indicating system for a vehicle having a liquid container comprising a pair of liquid level detecting elements arranged spaced apart in opposite positions on a detecting level of a liquid in said liquid container and along a straight line inclined with respect to the direction of movement of said vehicle, circuit means for generating an output signal when each of said liquid level detecting elements generates a signal indicating that the level of said liquid in said liquid container has dropped below said detecting liquid level, and an indicator actuated by said output signal from said circuit means.

3,939,471

LIQUID LEVEL TAMPER ALARM

Vernon B. Momberg, 113 Third St., Hood River, Oreg. 97031

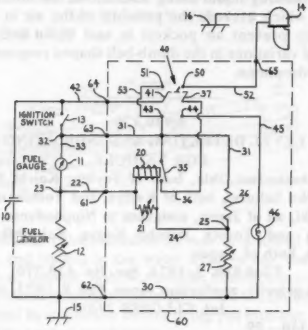
Filed Apr. 26, 1974, Ser. No. 464,499

Int. Cl.² B60Q *1/00*

U.S. Cl. 340—59 **5 Claims**

1. In a vehicle having a liquid fuel tank containing a variable resistance depth gauge transducer, an electric fuel gauge, an ignition switch, an electric traffic warning horn, and a battery, said transducer, fuel gauge and ignition switch being connected in series circuit across said battery; the improvement comprising a fixed resistance and an adjustable resistance connected in series between a terminal of said transducer which is connected to one terminal of said battery and a terminal of said fuel gauge which is connected to said ignition switch, a relay having one terminal connected between said fixed and adjustable resistances and another terminal connected between said transducer and fuel gauge to form a

bridge circuit which may be balanced by said adjustable resistance at any existing quiescent fuel level to maintain said relay normally deenergized and wherein any upward or downward movement of the fuel level will change the resistance of said transducer to unbalance said bridge circuit and energize said relay, and circuit means operable by energization of said relay to sound said horn, a signal lamp arranged to indicate a balanced or unbalanced condition of said bridge circuit; said circuit means comprising a relay switch which is closed by



energization of said relay, and a three position manual switch, said manual switch having an open position disconnecting both said horn and said signal lamp to prevent the energization thereof, said manual switch having a first closed position connecting said signal lamp in series with said relay switch to energize said lamp when said relay switch is closed, and said manual switch having a second closed position connecting said horn in series with said relay switch to energize said horn when said relay switch is closed.

3,939,472

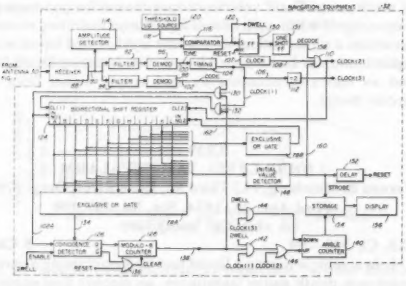
CODED NAVIGATION SYSTEM

Herbert L. Groginsky, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 280,320, Aug. 14, 1972, Pat. No. 3,818,478. This application Apr. 3, 1974, Ser. No. 457,539

Int. Cl.² G06F *11/00*; G01S *1/16*

U.S. Cl. 340—146.1 R **4 Claims**



1. In combination:

means for providing a sequence of signals;

means coupled to said sequence providing means and responsive to signals of said sequence for forming an additional signal;

a source of position data;

means, synchronized with said source of position data and coupled to said sequence providing means, for inserting said additional signal at an end of said sequence to provide a longer sequence;

means coupled to said sequence providing means and responsive to signals of a subsequence of said longer sequence for establishing the value of a signal external to said subsequence but contained within said longer sequence; and

means for replacing a signal of said subsequence with said signal which is external to said subsequence to recover said original sequence.

3,939,473

PROCESS FOR CORRECTING SIGNAL DISTORTIONS

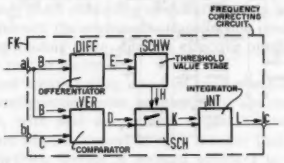
Ernst Alfred Fuchs, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 18, 1974, Ser. No. 462,025

Claims priority, application Germany, May 21, 1973, 2325765

Int. Cl.² H03K *5/18*; H04L *1/00*

U.S. Cl. 340—146.1 R **6 Claims**



1. A method for correcting signal distortions occurring in frequency-modulated data signals by deriving a rectangular binary signal from a defective demodulated signal using a correction signal, comprising the steps of:

differentiating the corrected demodulated signal to form a differential signal having zero transitions coinciding with the extreme values of the corrected demodulated signal,

forming a difference signal having amplitudes equal to the amplitude difference between the rectangular binary signal and the corrected demodulated signal at points in time coinciding with the time regions of the zero transitions of the differentiated signal and

producing said correcting signal from those components of said difference signal which occur at said points in time.

3,939,474

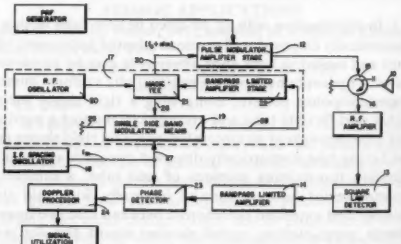
FULLY-COHERENT MULTIPLE FREQUENCY RADAR SYSTEM

Donald D. Coleman, Garden Grove, and Raymond F. Racine, Orange, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 20, 1965, Ser. No. 488,560

Int. Cl.² G01S *9/42*

U.S. Cl. 343—7.7 **10 Claims**



1. The combination comprising

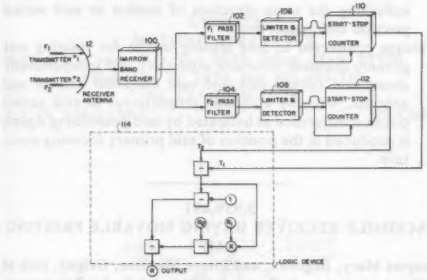
a system for transmitting a plurality of mutually coherent frequencies uniformly spaced apart in frequency by a preselected spacing frequency and for receiving echoes of said transmitted frequencies, and having a spacing frequency oscillator for generating said spacing frequency; and

coherent signal processing means responsive to said oscillator of said system and the beat frequencies between received echoes for providing a phase-detected receiver signal.

3,939,475
METHOD OF MEASURING RANGE WITH LARGE BISTATIC ANGLE RADAR

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 11, 1974, Ser. No. 514,047
Int. Cl.² G01S 9/37
U.S. Cl. 343—12 R **3 Claims**



1. A large bistatic-angle radar system for determining the distance, R, of a target from a receiving means comprising:

first and second transmitting means each adapted to transmit a radar signal of essentially the same frequency;

said receiving means receiving and separately processing target forward-scattered signals from said first and second transmitting means, and for measuring the time durations T_1 and T_2 during which each said respective forward-scattered signal is received at a signal strength greater than a predetermined level below its maximum received signal strength; and,

each said first and second transmitting means being spaced at a large bistatic-angle from said receiving means, said first transmitting means being spaced at a distance R_1 from said receiving means, and said second transmitting means being spaced at a distance R_2 from said receiving means wherein R_1 is greater than R_2;

whereby the distance R is computed from the equation

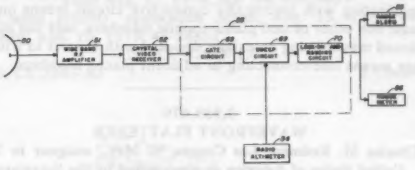
$$R = \frac{T_2R_1 - T_1R_2}{T_2 - T_1}$$

3,939,476
PASSIVE RANGING TAIL WARNING DEVICE

George W. Leopard, Rte. 1, Box 314C, Lexington Park, Md. 20653, and Kirby Hair, 9375 Knotte Ave., Anaheim, Calif. 92804

Filed May 19, 1959, Ser. No. 814,353
Int. Cl.² G01S 9/04; G08G 5/04
U.S. Cl. 343—112 R **5 Claims**

1. A system for passively measuring the range between a given point and a second point from which detectable radiations having distinguishable characteristics are emanating, comprising means for receiving at said given point direct radiations from said second point and indirect radiations from said second point which have been reflected from a reflecting surface, means for measuring the angle of elevation of said second point from said given point, means for measuring the altitude of said given point relative to said reflecting surface,

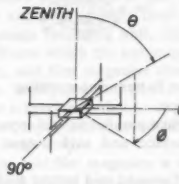


a gate circuit for rejecting all direct signals which are not followed by a reflecting signal within a predetermined time span, and computing means for determining the range from said given point to said second point as a function of said direct and reflected signal, said angle of elevation, and said altitude of said given point.

3,939,477
QUADRUPOLE ADCOCK DIRECTION FINDER AND ANTENNA THEREFOR

Terence C. Green; William G. Guion; Douglas N. Travers, and William M. Sherrill, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 6, 1973, Ser. No. 348,479
Int. Cl.² G01S 5/04
U.S. Cl. 343—113 R **39 Claims**

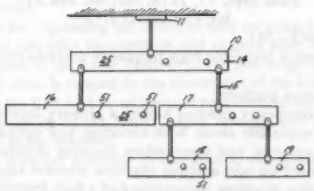


1. An antenna system comprising a plurality of dipole elements arranged as an electric field sampling antenna system, wherein output signals of said dipole elements are summed into two groups such that the signal difference of said two groups forms a quadrupole azimuth response.

3,939,478
ILLUMINATED MOBILE CONSTRUCTION

Leonard G. Lorch, 115 Lafayette Place, Woodmere, N.Y. 11598

Filed July 5, 1974, Ser. No. 485,774
Int. Cl.² H01Q 1/06
U.S. Cl. 343—721 **6 Claims**



1. As a new article of manufacture, an illuminated mobile comprising: a plurality of generally planar mobile members,

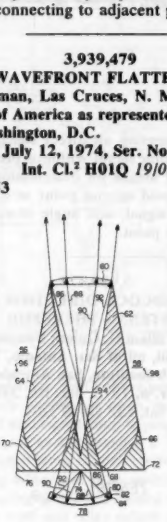
one of said members having means for pendant attachment from a relatively fixed point, linkage means interconnecting said planar members for relative orbital movement about said point, at least some of said planar members being of laminated configuration, and including a medially disposed layer having electrically conductive circuit means thereon and means communicating with electrically conductive circuit means on at least one other of said planar mobile members, said last mentioned means being co-axially disposed with respect to a linkage means interconnecting to adjacent planar members.

3,939,479

WAVEFRONT FLATTENER

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 12, 1974, Ser. No. 487,948
Int. Cl.² H01Q 19/06
U.S. Cl. 343—753 **1 Claim**



1. A wavefront flattener comprising:
an input surface,
an output surface parallel to said input surface,
said input surface and said output surface being dish shaped,
said input surface and said output surface comprising concentric rings of dielectric material,
said concentric rings having a high dielectric constant at the center thereof dropping to a low dielectric constant at the outermost rings, a reflective backing mounted on said output surface
whereby electromagnetic radiation is crowded into the center of said input and output surfaces to cause a flattening of a curved electromagnetic radiation wavefront.

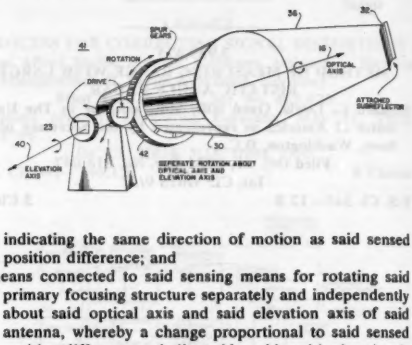
3,939,480

LEVEL AND CROSS-LEVEL STABILIZATION TECHNIQUE FOR SEARCH RADAR ANTENNAS

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 17, 1974, Ser. No. 506,927
Int. Cl.² H01Q 3/12
U.S. Cl. 343—761 **3 Claims**

1. A motion stabilized high-frequency antenna system comprising;
an antenna platform;
a high frequency antenna having a primary focusing structure moveable about both elevation and optical axes of said antenna, and a secondary focusing structure rigidly mounted on said antenna platform wherein said primary focusing structure is comprised of a high frequency feed-horn directed at an attached subreflector, said feed horn and subreflector movable in unison with respect to said secondary focusing structure;
means for sensing the position of said secondary focusing structure with respect to a desired position and for generating rotating means positioning signals proportional to the elevation axis and optical axis components of the position difference between said sensed position and said desired position, said optical axis positioning signal indicating a direction of motion opposite to said sensed position difference, and said elevation axis positioning signal



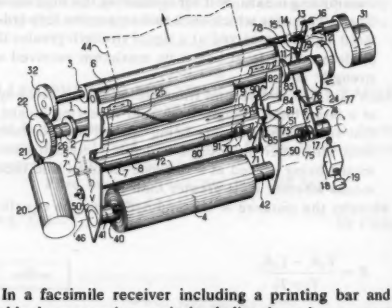
indicating the same direction of motion as said sensed position difference; and
means connected to said sensing means for rotating said primary focusing structure separately and independently about said optical axis and said elevation axis of said antenna, whereby a change proportional to said sensed position difference as indicated by said positioning signals is produced in the position of said primary focusing structure.

3,939,481

FACSIMILE RECEIVER HAVING MOVABLE PRINTING BAR

Jacques Mary, Bagneux, and Pierre Merillou, Grigny, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed July 30, 1974, Ser. No. 493,104
Claims priority, application France, Aug. 6, 1973, 73.28669
Int. Cl.² H04N 1/16; B41J 3/20
U.S. Cl. 346—74 E **4 Claims**



1. In a facsimile receiver including a printing bar and a rotatable drum carrying a printing helix adapted to cooperate with said printing bar to electrically print on a paper disposed therebetween, the improvement comprising printing bar support means for pivotably supporting said printing bar for movement from a rest position remote from said drum to an operative position where the printing bar bears on the helix, a control shaft mounted for axial rotation in parallel with said drum, a return lever mounted on said control shaft and bearing at one end against said printing bar support means so as to shift said printing bar support means to place said printing bar in its operative position upon rotation of said control shaft, bias means for normally biasing said printing bar support means to place said printing bar in its rest position, and control means responsive to rotation of said drum for rotating said

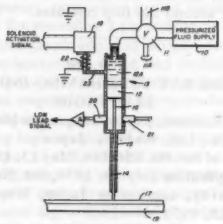
control shaft, said control means including a cam mounted on the shaft of said drum for rotation therewith, a control lever mounted on said control shaft in the plane of said cam so as to be displaced by said cam from a standby position to a locking position upon rotation of said drum thereby rotating said control shaft to force said return lever against said printing bar support means to shift said printing bar to its operative position, locking means for locking said control lever in its locking position during the initial rotation of said cam, and means for normally biasing said control lever toward its standby position, said locking means including a locking lever carrying a locking finger disposed in the plane of said cam and being biased into a position in the path of movement of said control lever, the end of said control lever being provided with a nib so as to permit said locking finger to ride up over the end of said control lever only when said control lever moves from its standby position to its locking position in response to rotation of said cam, said locking finger preventing return movement of said control lever.

3,939,482

WRITING APPARATUS

William L. Cotter, P.O. Box 2045, Salem, Mass. 01970

Filed Mar. 28, 1974, Ser. No. 455,737
Int. Cl.² G01D *15/24*
U.S. Cl. 346—139 C 21 Claims



1. An apparatus for writing or marking on a medium by means of an expendable piece of recording material said apparatus comprising;

means for retaining and guiding the piece of recording material having one end from which the piece of recording material is expelled,

movable means including means contacting the piece of recording material and means for selectively urging the contacting means,

means for commonly supporting said retaining means and movable means,

said means for selectively urging being operable to urge the contacting means against the recording material and to interrupt the urging force preparatory to retracting the piece,

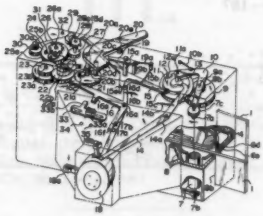
and means for retracting the piece from contact with the medium comprising bidirectional means connecting to said supporting means and means for selectively operating said bidirectional means to move said supporting means and retaining means toward the medium and relative to the stationary piece to thereby cause the piece to be retracted into the retaining means, and to thereafter move said supporting means and retaining means away from the medium to retract the piece from contact with the medium.

3,939,483

SELF-PROCESSING CAMERA

Yoshio Kuramoto, Toyonaka, and Hiroshi Ueda, Nara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 12, 1974, Ser. No. 495,963
Claims priority, application Japan, Aug. 15, 1973, 48-90830; Aug. 15, 1973, 48-90831
Int. Cl.² G03B *17/50*
U.S. Cl. 354—83 5 Claims



1. A self processing camera having a shutter and an exposure station and adapted to receive a film magazine containing a plurality of self-processing film units arranged linearly and at equal spacing along a leader paper which is folded to stack said film units in superposed relation, each of said film units comprising an image recording unit, a processing fluid containing portion disposed at one side of said image recording unit, and a trap for excess processing fluid disposed on the other side of said image recording unit, said film magazine having an exposure frame which the top image recording unit is positioned to face, said film magazine also having a rotatable take-up reel to which one end of said leader paper is secured and said film magazine further having a guide member for guiding the leader paper and exposed film units; said self processing camera comprising:

means for mounting said film magazine in said camera with the exposure frame of said magazine in facing relation to the exposure station of said camera;

a rotating member adapted to rotate uni-directionally for rotating the take-up reel of said film magazine to wind said leader paper around said take-up reel in a direction to move the exposed top image recording unit to a developing position at the termination of exposure of the camera shutter;

means including a spring driven member and a drive spring for turning said rotating member;

means for operating said spring driven member in a direction to charge said drive spring;

means for restraining said spring driven member in its spring charged position thereof;

means for releasing said spring driven member from its restrained position in response to the termination of an exposure of the camera shutter to rotate said rotating member;

means for regulating the speed of said rotating member;

a roller rotatably mounted on said camera body and biased relative to the guide member of the film magazine so that said roller is rotated by the movement of the leader paper and the film unit by an amount proportional to the extent of advance of the leader paper through said roller and said guide member;

a cam member rotatable in response to the rotation of said roller;

means for bringing said restraining means to its restraining position when said cam member rotates to an extent which corresponds to the movement of the leader paper to completely discharge an exposed image recording unit.

3,939,484
SHUTTER COCKING AND RELEASE MEANS FOR PHOTOGRAPHIC APPARATUS WITH EXPANSIBLE HOUSING

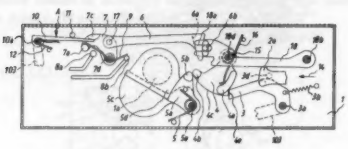
Alfred Winkler, Munich; Dieter Engelsmann, Unterhaching; Dieter Maas, Munich, and Rolf Schröder, Baldham, all of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Germany

Filed Sept. 23, 1974, Ser. No. 507,833

Claims priority, application Germany, Sept. 22, 1973, 7334432[U]

Int. Cl.² G03B *17/04, 17/38*

U.S. Cl. 354—187 **10 Claims**



1. In a photographic apparatus, a combination comprising a housing having a first section and a second section, said second section being reciprocable with respect to said first section between first and second positions; release means mounted in said first section and having a first member movable between starting and operative positions; a normally open shutter-actuating switch mounted in said first section; means for closing said switch, including a second member movable between starting and operative positions in which said switch is respectively open and closed, said second member being located in the path of movement of said first member at least when said second member assumes said starting position; and means for blocking the movement of at least one of said members while said second section assumes said first position, including a device which is movable by said second position and is arranged to move said one member to its respective starting position to thereby open said switch and to hold said one member against movement to the respective operative position when said second position assumes said first position but to permit the movement of said one member to the respective operative position in response to movement of said second section from said first to said second position so that each closing of said switch in response to movement of said first member from said starting to said operative position thereof must be preceded by a movement of said second section from said second to said first and back to said second position thereof.

3,939,485
MAGNETIC RECORDING AND/OR REPRODUCING SYSTEM

Shinji Amari, Hoya, and Takashi Masuda, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 18, 1975, Ser. No. 550,645

Claims priority, application Japan, Feb. 18, 1974, 49-19259

Int. Cl.² H04N *5/79*

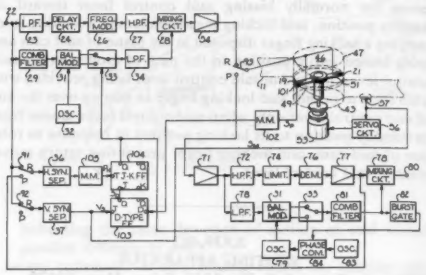
U.S. Cl. 358—4 **6 Claims**

1. In a system in which television signals comprising line intervals and field intervals are recorded on a recording medium by rotary transducer means, the television signal including chrominance components, the system including switching means to cause at least selected ones of the chrominance components to have one polarity in every line interval in alternate field intervals and to change from the one polarity to the opposite polarity at the end of selected line intervals of the remaining alternate field intervals, switch controlling means comprising:

A. a first flip-flop responsive to a first timing signal at the field repetition rate;

B. a signal generator to generate signals synchronous with rotation of the transducer means, said signal generator being connected to a control terminal of said flip-flop to control the polarity of the output signal therefrom to have a specific polarity during even fields and reverse polarity during odd fields;

C. a second flip-flop responsive to a second timing signal at the line repetition rate; and



D. a connection from an output terminal of said first flip-flop to a controlling input terminal of said second flip-flop to allow said second flip-flop to operate only during those alternate fields when the output signal of said first flip-flop has a predetermined one of said polarities, said second flip-flop having an output signal of predetermined polarity for the first line interval of each of the fields in which the second flip-flop operates.

3,939,486
CATHODE RAY TUBE HAVING INDEX STRIP ELECTRODE

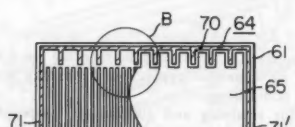
Kaoru Tomii, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 256,164, May 23, 1972, abandoned. This application July 19, 1974, Ser. No. 489,897

Claims priority, application Japan, May 26, 1971, 46-36536; Apr. 28, 1972, 47-42919

Int. Cl.² H04N *9/06, 9/22, 9/24*

U.S. Cl. 358—46 **14 Claims**



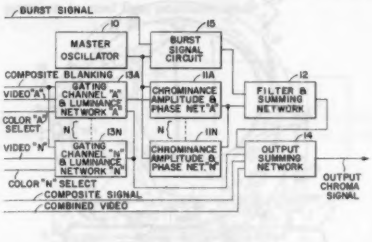
1. A color television camera tube comprising in combination: an evacuated envelope having a faceplate at one end thereof and an electron gun at the other end for emitting an electron beam toward said faceplate, a color filter on said faceplate and having recurrent groups of successively arranged vertically extending strips for passing light of different colors, a photoelectrical layer inwardly from said filter, means for scanning said electron beam in a horizontal direction, means for deflecting said beam in a vertical direction to scan a given rectangular area of said photoelectrical layer, a comb-like electrode disposed on said faceplate outside of said given rectangular area and adjacent to one horizontal edge of said scanned area and having a plurality of vertically extending, horizontally equally spaced apart teeth, and a pair of elec-

trodes disposed within said scanned area and extending along the opposite vertical edges of said scanned area.

3,939,487
COLOR VIDEO SIGNAL GENERATORS

William Leventer, 18 Bruce Lane, East Northport, N.Y. 11731

Filed Oct. 5, 1973, Ser. No. 403,868
Int. Cl.² H04N 1/46, 9/02
U.S. Cl. 358—81 2 Claims



1. Color video signal generating apparatus for providing video signals for TV transmission purposes, comprising:

means for providing a master square wave signal of at least 3,579,535 hertz to at most 3,579,555 hertz;

means responsive to said master signal for providing an intermediate signal being selectable between 0 or 180° phase;

means for providing a plurality of digital command signals;

a plurality of means, responsive to said master square wave signal, each for providing a chrominance signal having a predetermined amplitude and phase associated with a different predetermined color and including a resistive means responsive to said intermediate signal, an inverting logic element responsive to said intermediate signals, and a reactive impedance means responsive to the output of said inverting logic means and whose output is combined with the output of said resistive means;

a plurality of digital gating means, each corresponding to a different one of said chrominance signal means and responsive to said digital command signals, for selectively activating predetermined ones of said chrominance signal means, and each including means for providing a luminance signal having a preselected amplitude associated with a different predetermined color;

means for adjusting the amplitude of the combined output of said resistive means and reactive ampedance means to produce for each chrominance signal means a chrominance channel signal associated with a particular color;

means for combining the chrominance channel signals and for filtering said combined signal including an LC circuit tuned to 3,579,545 hertz for extracting the fundamental frequency of said combined chrominance channel signals; and

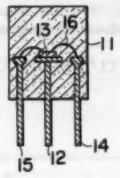
gating means responsive to a composite blanking signal, said master signal and a burst flag signal for providing a gated 3,579,545 hertz for combining with said combined chrominance channel signal.

3,939,488
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE AND RESULTING PRODUCT

Yoshiaki Wakashima, Kawasaki, and Hiroshi Suzuki, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 28, 1974, Ser. No. 446,792
Claims priority, application Japan, Feb. 28, 1973, 48-23209
Int. Cl.² H01L 29/34
U.S. Cl. 357—72 24 Claims

1. A method for sealing a semiconductor device comprising covering a semiconductor element with a protective covering layer containing a metal-containing stabilizer which prevents the migration of mobile substances and mobile ions within the protective covering layer, said metal-containing stabilizer

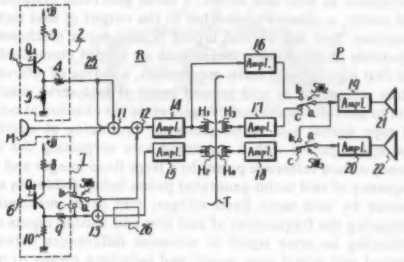


comprising a salt of an organic acid, an alcoholate, a phenolate or mercaptide, the metal component of said metal-containing stabilizer being selected from the group consisting of Ca, Mg, Sr, Cd, Zn, Sn and Pb.

3,939,489
RECORDING AND REPRODUCING APPARATUS

Norifumi Kawashima, Chigasaki; Kiyokazu Kamijima, Tachikawa, and Yoshiaki Yakeuchi, Ichikawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 26, 1974, Ser. No. 500,257
Claims priority, application Japan, Aug. 30, 1973, 48-101822
Int. Cl.² G11B 27/02
U.S. Cl. 360—13 20 Claims



1. Recording and reproducing apparatus comprising:

means for supplying stereo signal components including a monaural signal component;

signal processing means for replacing said supplied monaural signal component included in said stereo signal components with a further monaural signal component;

first recording means for recording said processed stereo signal components including said further monaural signal component;

second recording means for recording said supplied stereo signal components including said supplied monaural signal component;

reproducing means for reproducing the recorded stereo signal components including said further monaural signal component and the recorded stereo signal components including said supplied monaural signal component; and

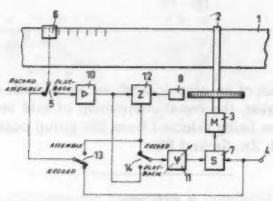
sound generating means coupled to said reproducing means for generating sounds corresponding to said respective reproduced signals.

3,939,490

APPARATUS FOR ASSEMBLING VIDEO SEQUENCES ON TAPE IN PHASE SYNCHRONIZATION

Christian Opelt, Bernbach, Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh. Max Grundig, Furth, Bavaria, Germany

Filed Feb. 5, 1975, Ser. No. 547,265
Claims priority, application Germany, May 15, 1974, 2423489
Int. Cl.² H04N 5/795
U.S. Cl. 360—14 2 Claims



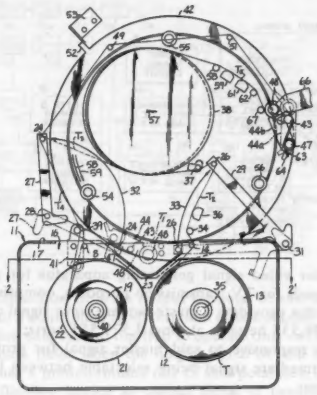
1. Apparatus for recording and reproducing video signals on and from a magnetic tape respectively comprising one or more video heads rotating in a cylindrical drum surrounded helically by said video tape and comprising a fixed magnetic head to record or reproduce synchronizing signals on or from a longitudinal track of said magnetic tape; comprising further a tape transport mechanism to drive said tape at a constant speed, a motor of said tape transport mechanism, a servo mechanism to feed said motor, a tacho-generator coupled to said motor, a counter connected to the output of said tacho-generator, first and second inputs of said servo mechanism, adjustable phase shifting means with an output connected to said first input of said servo mechanism, a source of reference pulses connected to said second input of said servo mechanism to provide means to drive said servo mechanism at nominal tape speed; said tacho-generator producing at nominal tape speed pulses with a repetition rate surpassing the frequency of said reference pulses by a large fixed integer and the frequency of said tacho-generated pulses being divided in said counter by said same fixed integer; said servo mechanism comparing the frequencies of said first and second inputs and generating an error signal to minimize differences between nominal and actual tape speed; and switching means to provide normal record, playback and assemble modes of said apparatus whereby in the normal record mode said reference pulses are additionally fed to said fixed head and recorded thereby on said longitudinal track as synchronizing signals and the output of said counter is fed through said phase shifting means to said first input of said servo mechanism for comparison with said reference pulses in said servo mechanism; in the play back mode said synchronizing signals are reproduced by said fixed head from said longitudinal track and are fed through said phase shifting means to said first input of said servo mechanism and compared with said reference pulses in said servo mechanism, said phase shifting means being adjustable to the phase of said synchronizing pulses to provide the best tracking of said rotating video heads; said synchronizing pulses being additionally fed to said counter to set the phase of the divided tacho-generated pulses in said counter output; and in the assemble mode the preset output pulses of said counter are fed to said phase shifting means to said first input of said servo mechanism for comparison with said reference pulses in said servo mechanism and, at the same time, are fed to said fixed head and recorded there on said longitudinal track.

3,939,491

TAPE APPARATUS INCLUDING MEANS TO COUNT LENGTH-RELATED PULSES FOR VIDEO EDITING

Yasuo Shigeta, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 24, 1974, Ser. No. 491,513
Claims priority, application Japan, Aug. 9, 1973, 48-89472
Int. Cl.² G11B 27/02, 27/30; H04N 5/795
U.S. Cl. 360—14 17 Claims



1. In video tape apparatus comprising a rotatable head drum, means for loading tape on said apparatus in a first position in which a loop of said tape is wrapped around a portion of said rotatable head drum and engages an arcuate surface of said drum, and means for moving said tape lengthwise along said loop at a controlled speed suitable for signal recording and playback when said tape is in said first position, the combination comprising:

A. means for loading said tape on said apparatus in a second position in which a shorter loop of said tape does not substantially engage said rotatable head drum;

B. means for moving said tape along its length at a higher speed than said controlled speed when said tape is in said second position;

C. timing pulse transducing means located adjacent said tape in said second position to generate pulses synchronous with tape synchronizing signals recorded on said tape; and

D. a counter for counting said pulses from said timing pulse transducing means.

3,939,492

LOCKING MECHANISM FOR CONTROL LEVER IN MAGNETIC TAPE RECORDER

Tekeshi Takeda, Iwaki, Japan, assignor to Alps Motorola Inc., Tokyo, Japan

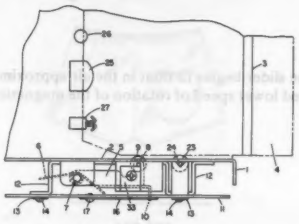
Filed Dec. 18, 1974, Ser. No. 533,808
Claims priority, application Japan, Feb. 16, 1974, 49-18948
Int. Cl.² G11B 15/02
U.S. Cl. 360—61 5 Claims

1. A locking mechanism for a function control lever used in a magnetic tape recording/reproducing apparatus having a chassis with a cartridge receiving chamber adapted to receive a tape cartridge upon insertion of the cartridge therein, wherein the function control lever is operable in at least a first reproducing position and a second recording position, the locking mechanism including in combination:

at least first and second engageable portions on said function control lever corresponding to said first and second positions thereof, respectively;

a movable member mounted on said chassis adjacent the cartridge receiving chamber and including a cartridge engaging portion mounted thereon, said movable member being movable between a first position wherein said cartridge engaging portion is positioned inside the cartridge receiving chamber and a second position wherein said cartridge engaging portion is in engagement with a cartridge inserted in the cartridge receiving chamber and is substantially outside such chamber;

spring means on said chassis coupled with said movable member to bias said movable member from said second position to said first position; and



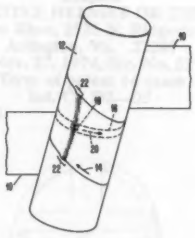
a control lever engaging portion mounted on said movable lever for movement therewith for engagement with whichever one of said first and second engageable portions of said function control lever is aligned therewith when said movable member is in said second position, whereby said function control lever is locked into whichever of said first and second positions it was in at the time said movable member moved from said first position to said second position, engaging portion being out of engagement with the engageable portions of said function control lever with said movable member in said first position.

3,939,493

TAPE LIFTER

Thomas M. Fowler, Longmont; Harvey R. Fraser, Jr., and Francis E. Hauke, both of Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,321
Int. Cl.² G11B 5/60
U.S. Cl. 360—84 **12 Claims**



1. Apparatus for reducing wear on magnetic head and magnetic tape in a rotating-head tape recording device comprising:

mandrel means for supporting the tape along the arcuate path of the rotating head;

pneumatic means for generating an air flow locally about the head lifting the tape as the head rotates to avoid contact between head and tape when the head is not reading or writing information;

said mandrel means providing uniform support of tape as tape wraps said mandrel means except that additional support of tape due to air flow generated by said pneumatic means forms a chimney between the tape and said mandrel means;

said chimney conducts the additional air flow to the edge of the tape and travels with the rotating head lifting tape away from the head as the head passes under the tape.

3,939,494

RESILIENT TAPE GUIDE ASSEMBLY FOR TAPE RECORDING AND/OR REPRODUCING APPARATUS

Shinji Okuda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 20, 1974, Ser. No. 444,131
Claims priority, application Japan, Feb. 26, 1973, 48-24320[U]
Int. Cl.² G11B 15/60
U.S. Cl. 360—84 **6 Claims**

1. In a tape recording and/or reproducing apparatus having a tape guide drum with a circumferential slot, and at least one rotary transducer projecting through said slot for recording and/or reproducing signals on a tape running against the periphery of said drum in a path which extends about at least a portion of said periphery; a guide assembly for the tape on said drum comprising rigid guide means extending along said portion of the drum periphery and engageable by one longitudinal edge of the tape in said path for establishing the direction and location of said path, and a plurality of resilient elongated guide elements spaced apart along said portion of the drum periphery and having respective contact end portions individually acting yieldably against the other longitudinal edge of the tape at apaced apart locations along the latter in said path for holding the tape in contact with said rigid guide means while accommodating variations and changes in the width of said tape, each of said resilient guide elements including an anchoring end portion fixed relative to said drum, and an intermediate portion extending along the periphery of said drum from said anchoring end portion to said contact end portion and being inclined toward said path with said contact

end portion being resiliently swingable about an axis defined by said anchoring end portion.

3,939,495

METHOD FOR ADJUSTING THE ANGLE OF ATTACK OF A FLOATING MAGNETIC HEAD

Hiroshi Nagai, Chigasaki, and Yoshihiko Miyake, Odawara, both of Japan, assignors to Hitachi, Ltd., Japan

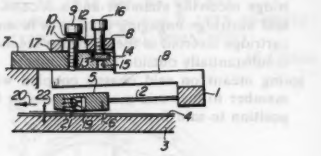
Filed Dec. 16, 1974, Ser. No. 533,024

Claims priority, application Japan, Dec. 19, 1973, 48-141309

Int. Cl.² G11B 5/56, 5/60, 21/20

U.S. Cl. 360—103 **6 Claims**

1. A method for adjusting the angle of attack of a floating magnetic head comprising selecting a speed of rotation of a magnetic member which is lower than the speed of rotation for normal operation of the magnetic member while the apparatus is in operation, rotating the magnetic member at approximately the preselected lower speed of rotation, and adjusting the angle of attack of the slider supporting the magnetic head



so that the slider begins to float in the air approximately at the preselected lower speed of rotation of the magnetic member.

DESIGNS

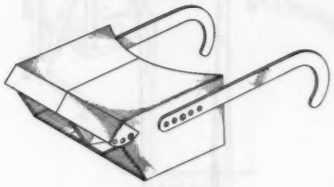
FEBRUARY 17, 1976

238,828
TENNIS SHORTS
Robert E. Reed, Woonsocket, R.I., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 14, 1974, Ser. No. 432,979
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—42

238,829
SAFETY HELMET
De Anna M. Breece, El Monte, Calif., (1336 Galway, Billings, Mont. 59101)
Filed Sept. 9, 1974, Ser. No. 504,037
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

238,830
PROTECTIVE HELMET OR THE LIKE
Jhoon Goo Rhee, 2525 N. Ridgeview Road, Arlington, Va. 22207
Filed Nov. 27, 1974, Ser. No. 527,903
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

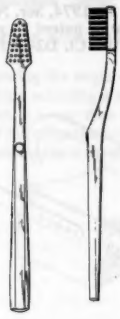
238,831
FOLDING FLIGHT TRAINING HOOD
Bernard B. Helfand, deceased, late of Tiburon, Calif., by Phyllis Jones Neidig Helfand, executrix, 240 Loma Ave., Tiburon, Calif. 94920
Filed May 20, 1974, Ser. No. 471,318
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234



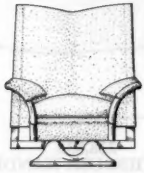
238,832
SLIPPER SOLE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Aug. 22, 1974, Ser. No. 499,495
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

238,833
TOOTHBRUSH HANDLE
Lars Hjelle, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway
Filed June 26, 1973, Ser. No. 373,656
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25

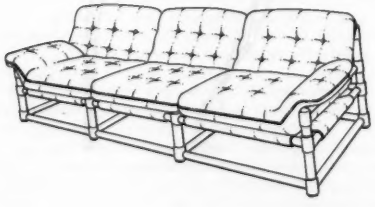
238,834
TOOTHBRUSH
Lars Hjelle, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway
Filed Jan. 14, 1974, Ser. No. 433,105
Claims priority, application Norway Nov. 26, 1973
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



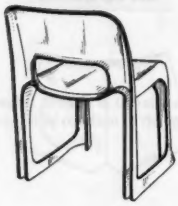
238,835
ARMCHAIR
Cesare Cassina, Carimate, Italy, assignor to Centro Cassina S.r.l., Milan, Italy
Filed Feb. 4, 1974, Ser. No. 439,363
Claims priority, application Italy Aug. 3, 1973
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—26



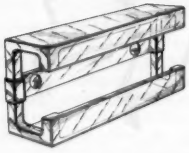
238,836
SOFA
Eugene J. Costabile, Oak Lawn, Ill., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Oct. 11, 1974, Ser. No. 514,059
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



238,837
STACKABLE CHAIR
George C. Mulhauser, 545 Clinton Road, Paramus, N.J. 07652
Filed Aug. 7, 1973, Ser. No. 386,322
Claims priority, application Sweden Feb. 7, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—65

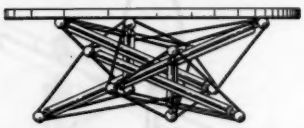


238,838
PAPER TOWEL DISPENSER
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,481
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—96

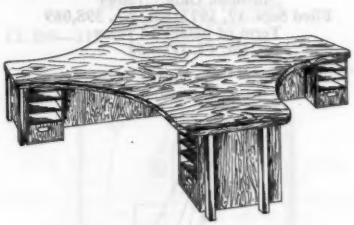


238,839
GLOVE RACK
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,488
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D6—*04*; D23—*02*
U.S. Cl. D6—116

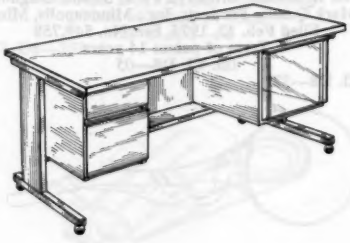
238,840
TABLE
Cesare Cassina, Carimate, Italy, assignor to Centro, Cassina S.r.l., Milan, Italy
Filed Feb. 5, 1974, Ser. No. 440,130
Claims priority, application Italy Sept. 21, 1973
Term of patent 7 years
Int. Cl. D6—*03*
U.S. Cl. D6—146



238,841
MULTIPLE STATION DESK
Ivan F. Goulooze, 3407 3 Mile Road NW., Grand Rapids, Mich. 49504
Filed Mar. 18, 1974, Ser. No. 451,963
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—146



238,842
DESK
Robert J. Szucs, Midlothian, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Aug. 5, 1974, Ser. No. 494,673
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



238,843
DESK
Robert J. Szucs, Midlothian, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Oct. 31, 1974, Ser. No. 519,474
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161

238,844
CABINET
Robert J. Szucs, Midlothian, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Aug. 5, 1974, Ser. No. 494,805
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—165

238,845
TRAY
Leland H. Logue, 150 S. Marion Parkway, Denver, Colo. 80209
Filed Apr. 19, 1974, Ser. No. 462,236
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—20

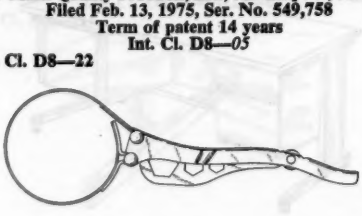
238,846
NUT DISPENSER
William Finnegan, 7200 Beverly Blvd.
Los Angeles, Calif. 90036
Filed Mar. 6, 1974, Ser. No. 448,554
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—98

238,847
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, 306 N. McBride St.,
Syracuse, N.Y. 13203
Filed Oct. 25, 1973, Ser. No. 409,727
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

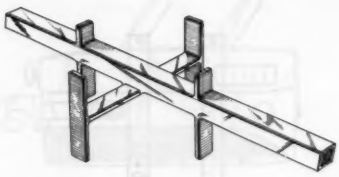
238,848
SPOON OR SIMILAR ARTICLE OF FLATWARE
Ronald Sneidman, 66 Calvin Ave.,
Syosset Estates, N.Y. 11791
Filed Mar. 11, 1974, Ser. No. 450,129
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—151

238,849
CARPET CLEANING APPARATUS
Terry H. Jones, 1226 Greenbriar Court,
Norman, Okla. 73069
Filed Sept. 17, 1973, Ser. No. 398,089
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—165

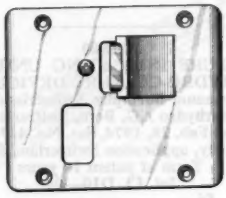
238,850
OIL CHANGING WRENCH
Steven R. Jensen, Brooklyn Park, Minn., assignor to
J-Mark Quality Products, Inc., Minneapolis, Minn.
Filed Feb. 13, 1975, Ser. No. 549,758
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—22



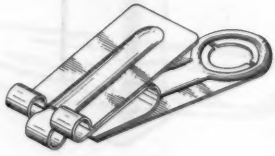
238,851
CAPPING TOOL FOR PLASTIC BARRELS CONTAINING PREGNANT MARE URINE
Russell D. Lawrence and Henry Heuchert, Brandon, Manitoba, Canada
Filed Mar. 18, 1974, Ser. No. 452,024
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—27



238,852
COMBINED RESCUE DOOR STOP AND STRIKER PLATE
Larry K. Johnson, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.
Filed May 2, 1974, Ser. No. 466,166
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—117



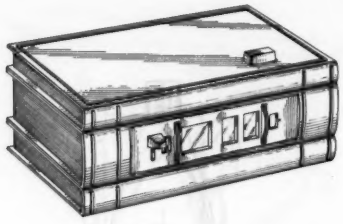
238,853
DECORATIVE CLIP
James Brompton Kruger, Oxford, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Sept. 20, 1974, Ser. No. 507,682
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—259



238,854
BOTTLE OR SIMILAR ARTICLE
William J. Britt, Greenville, S.C., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.
Filed Apr. 18, 1974, Ser. No. 461,947
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—144

238,855
COMBINED ACTUATOR AND DISPENSING CAP FOR A PRESSURIZED CONTAINER
Thomas H. Hayes, Greenwich, Conn., assignor to VCA Corporation, Greenwich, Conn.
Filed Dec. 10, 1973, Ser. No. 423,513
Term of patent 14 years
The portion of the term of the patent subsequent to Feb. 26, 1989, has been disclaimed
Int. Cl. D9—*01*
U.S. Cl. D9—258

238,856
DIGITAL ELECTRIC ALARM CLOCK
Alan E. Koplar, Lincolnwood, Ill., assignor to Lava-Simplex Internationale, Inc., Chicago, Ill.
Filed Feb. 22, 1974, Ser. No. 444,851
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—6

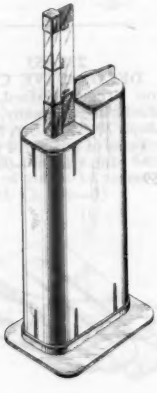


238,857
CLOCK
Henri Viatte, 48 Creation, Ch. du Vorbourg, 2800 Delemont, Switzerland
Filed Apr. 1, 1974, Ser. No. 456,889
Claims priority, application Switzerland Oct. 8, 1973
Term of patent 7 years
Int. Cl. D10—*01*
U.S. Cl. D10—6

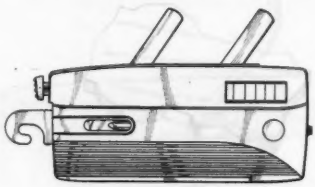
238,858
HAND HELD OPTICAL CHARACTER RECOGNITION SCANNING UNIT
Rodney Barclay, Richardson, and Robert B. Koenig, Dallas, Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.
Filed Jan. 17, 1974, Ser. No. 434,192
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

238,859
INSTRUMENT FOR THE DISPLAY OF PROCESSED INFORMATION
Colin Simister Gaskell, Waresley, and Rory Morgan O'Brien, Weston, England, assignors to Alfred Herbert Limited, Coventry, England
Filed Apr. 17, 1974, Ser. No. 461,716
Claims priority, application Great Britain Oct. 22, 1973
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

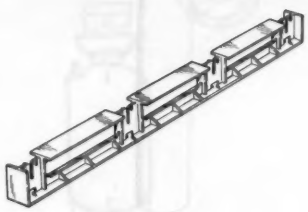
238,860
MOISTURE INDICATING UNIT FOR HYDRO-CULTURE DEVICES
Gerhard Baumann, Buempliz, Switzerland, assignor to Interhydro AG, Bern, Switzerland
Filed Feb. 28, 1974, Ser. No. 447,042
Claims priority, application Switzerland Sept. 6, 1973
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—56



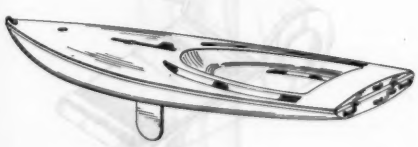
238,861
CABLE HANDLING DEVICE
Michel Cavalieri, Neuilly-sur-Marne, France, assignor to Tractel S.A., Paris, France
Filed June 5, 1973, Ser No 367,336
Claims priority, application France Dec. 26, 1972
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—53



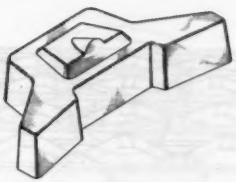
238,862
PALLET COMPONENT
Kenneth E. Hewson, 626 Colony Drive, Troy, Mich. 48084
Filed Nov. 11, 1974, Ser. No. 522,323
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D12—53



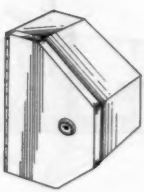
238,863
SAILBOAT
Hobart L. Alter, Capistrano Beach, Calif., assignor to Coast Catamaran Corporation
Filed May 28, 1974, Ser. No. 473,911
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—64



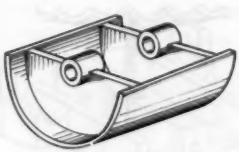
238,864
BODY FOR MOTORCYCLE RADIO CADDY
Manuel D. Masterson, 413 Stedman Place, Monrovia, Calif. 91016
Filed Feb. 24, 1975, Ser. No. 552,159
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



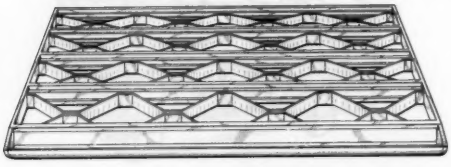
238,865
MOTORCYCLE CHAIN STORAGE COMPARTMENT
Bennett L. Heck, 2316 N. Neva, Chicago Ill. 60635, and Kenneth W. Raczynski, 2925 N. Normandy, Chicago, Ill. 60634
Filed Sept. 3, 1974, Ser. No. 502,779
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



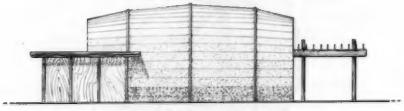
238,866
LANDING GEAR FOOT
Hyle K. Claflin, Kent, Mich., assignor to Westran Corporation
Filed Jan. 28, 1974, Ser. No. 437,508
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—217



238,867
STAIR TREAD
Ronald McKenzie Howells, Yennora, New South Wales, Australia, assignor to Comalco (J & S) Pty. Limited
Filed Nov. 6, 1972, Ser. No. 303,851
Claims priority, application Australia June 8, 1972
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1.5

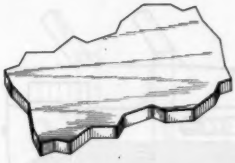


238,868
RESTAURANT BUILDING STRUCTURE
Albert C. Friedrich, San Jose, Calif., assignor to Wine Barrel Corporation, Campbell, Calif.
Filed July 30, 1973, Ser. No. 384,015
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B



238,869
CANOPY
Nobujiro Isono, 2216 Hichiken-cho, Sano, Tochigi Prefecture, Japan
Filed June 18, 1974, Ser. No. 481,366
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 D

238,870
MASONRY BLOCK
Samuel Alan Appleton, Dytap House, Ruishton, Taunton, Somerset, England
Continuation-in-part of abandoned design application Ser. No. 296,540, Oct. 11, 1972. This application Oct. 10, 1973, Ser. No. 405,105
Claims priority, application Great Britain Apr. 19, 1972
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 R



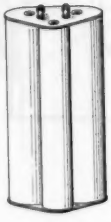
238,871
CAP FOR A WRITING INSTRUMENT
Clarence D. Zierhut, Granada Hills, and Walter Susumu Nakano, Los Angeles, Calif., assignors to The Gillette Company
Filed Apr. 20, 1973, Ser. No. 353,729
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—57

238,872
COMBINED MEMO PAPER DISPENSER AND PENCIL HOLDER
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company, Ltd., Tokyo, Japan
Filed July 19, 1972, Ser. No. 273,221
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—89

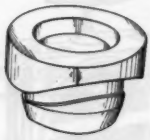
238,873
FISHING LURE HOLDER
Emery L. West, 6900 NW. 63rd St., Bethany, Okla. 73008
Filed May 17, 1974, Ser. No. 470,801
Term of patent 14 years
Int. Cl. D22—*99*
U.S. Cl. D22—99

238,874
TANK FOR A PORTABLE SPRAYER
Fernand Berthoud, Belleville-sur-Saone, France, assignor to Berthoud, Belleville-sur-Saone, Rhone, France
Filed May 30, 1974, Ser. No. 474,401
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

238,875
WATER PURIFICATION TANK COMBINATION
William J. Berry, Jr., and William J. Berry III, both of 1021 Green St., Durham, N.C. 27701
Filed Feb. 14, 1974, Ser. No. 442,311
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

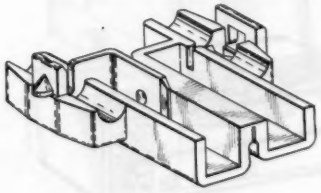


238,876
TUBE CONNECTOR
Rune Sigvard Andersson, Berchshill, Angelholm, Sweden
Filed July 30, 1973, Ser. No. 383,479
Claims priority, application Sweden Jan. 29, 1973
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



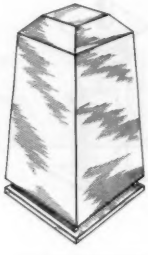
238,877
ALCOHOL BURNER AND CAP THEREFOR
Robert Maddestra, Canton, and David E. Munn, Framingham, Mass., assignors to Damon Corporation, Needham Heights, Mass.
Filed Aug. 14, 1974, Ser. No. 497,197
Term of patent 14 years
Int. Cl. D7—*02;* D23—*03*
U.S. Cl. D23—72

238,878
ELECTRICAL CONNECTOR
Guy Vernon Harkins, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 21, 1975, Ser. No. 560,742
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1

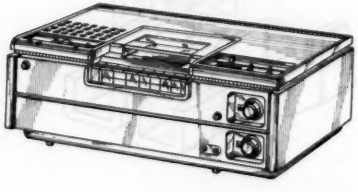


238,879
TAPE PLAYER
Susumu Yamamoto, Kadoma, Osaka, Japan, assignor to Matsushita Electric Industrial Company, Ltd., Kadoma, Osaka, Japan
Filed Apr. 30, 1974, Ser. No. 465,653
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

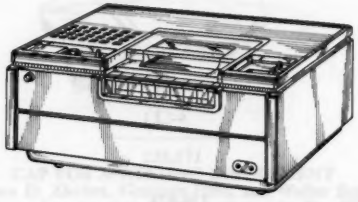
238,880
HOUSING FOR A STEREOPHONIC LOUDSPEAKER
Gary I. Elwell, 821 W. Roseburg Ave., Modesto, Calif. 95350
Filed June 25, 1974, Ser. No. 483,020
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G



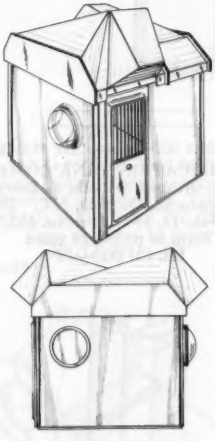
238,881
VIDEO TAPE RECORDER
Harumitsu Ishii, Yokosuka, and Noriaki Kozuka, Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 3, 1974, Ser. No. 529,128
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



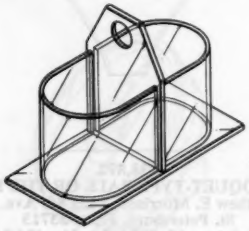
238,882
VIDEO TAPE RECORDER
Harumitsu Ishii, Yokosuka, and Noriaki Kozuka, Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 3, 1974, Ser. No. 529,216
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



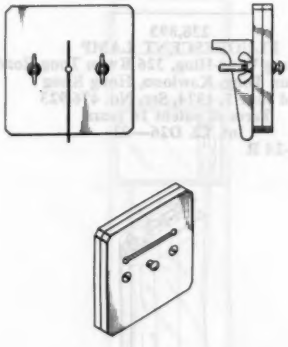
238,883
BOX FOR HORSES
Yves Chailleux and Jean-Paul Dumontier, Grigny, and Patrick Texier, La Varenne, France, assignors to Societe Civile Cooperative d'Architectes Atelier de la Reale
Filed Sept. 13, 1973, Ser. No. 397,210
Claims priority, application France Mar. 15, 1973
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



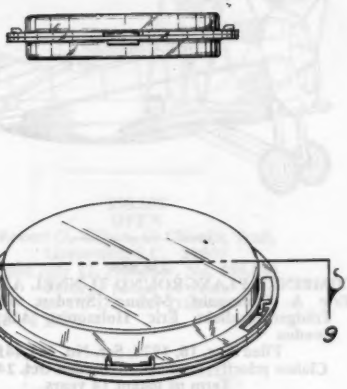
238,884
AQUARIUM OR SIMILAR ARTICLE
Tony Robert, 5701 Southwest Freeway, Houston, Tex. 77027
Filed May 2, 1974, Ser. No. 466,235
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—6



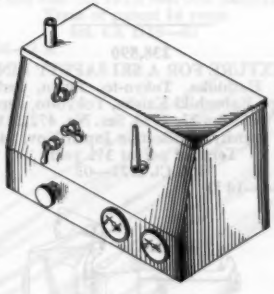
238,885
HOLDER FOR A FOOD BOWL FOR PETS
Tony Robert, 5701 Southwest Freeway, Houston, Tex. 77027
Filed May 2, 1974, Ser. No. 466,233
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



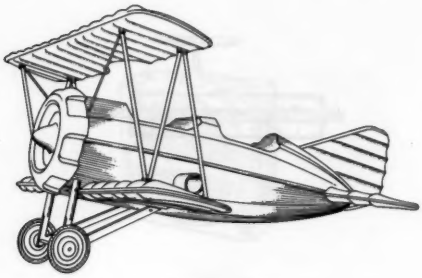
238,886
PETRI DISH
Manuel Goy, 1215 S. Cloverdale Ave., Los Angeles, Calif. 90019
Filed Dec. 11, 1974, Ser. No. 531,667
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—1 R



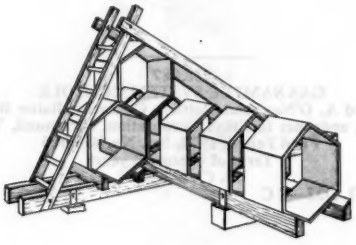
238,887
GAS SAMPLE SYSTEM CONSOLE
Edward A. O'Neal and Gottlieb C. Gaeke, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.
Filed Feb. 4, 1974, Ser. No. 439,006
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D32—2 C



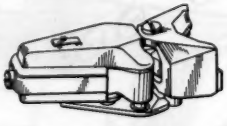
238,888
AMUSEMENT RIDE VEHICLE
David E. Bradley, Jr., 502 Huntley Drive, Los Angeles, Calif. 90048
Filed Apr. 8, 1974, Ser. No. 458,773
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L



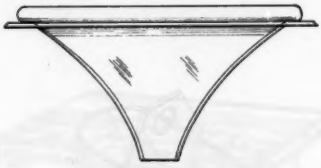
238,889
COMBINED PLAYGROUND TUNNEL AND SLIDE
Eric A. Holmquist, Malmo, Sweden, assignor to Trädgardsarkitekt Eric Holmquist AB, Malmo, Sweden
Filed Apr. 16, 1974, Ser. No. 461,441
Claims priority, application Sweden Oct. 24, 1973
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 E



238,890
TOE FIXTURE FOR A SKI SAFETY BINDING
Noriyasu Hashioka, Tokyo-to, Japan, assignor to Hope Kabushiki Kaisha, Tokyo-to, Japan
Filed May 22, 1974, Ser. No. 472,381
Claims priority, application Japan Nov. 24, 1973
Term of patent 3½ years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

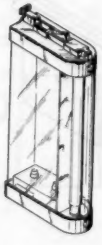


238,891
MARBLE RUNWAY
James Walton Smith, 20 Martindale, Greenwich, Conn. 06380
Filed Oct. 3, 1973, Ser. No. 403,326
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 K

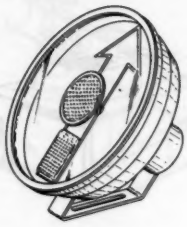


238,892
BILBOQUET-TYPE BALL OR THE LIKE
Matthew E. Morrison, 2455 8th Ave. N., St. Petersburg, Fla. 33713
Filed Aug. 13, 1974, Ser. No. 496,945
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 P

238,893
FLUORESCENT LAMP
Herbert Tang Wing-Hing, 326 Kwun Tong Road, Kwun Tong, Kowloon, Hong Kong
Filed June 5, 1974, Ser. No. 476,923
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R

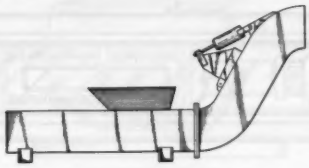


238,894
DIRECTION INDICATOR FOR VEHICLES, SPECIFICALLY FOR CYCLES AND MOTORCYCLES
Henriette Joly, 22 Avenue Parmentier, 75 Paris 11°, France
Filed June 19, 1974, Ser. No. 480,687
Claims priority, application Switzerland April 18, 1974
Term of patent 14 years
Int. Cl. D10—*06*; D26—*06*
U.S. Cl. D48—32 E

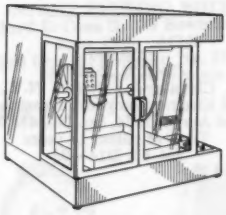


238,895
GASOLINE PUMP
Edward Albright, Paris, France, assignor to SATAM Industries, La Courneuve, France
Filed June 27, 1974, Ser. No. 483,550
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—2 A

238,896
HORIZONTAL TRASH COMPACTOR
Lewis P. White, 3436 Brookwood Road, Birmingham, Ala. 35223
Original design application Apr. 11, 1972, Ser. No. 243,113, now Patent No. 234,814, dated Apr. 8, 1975. Divided and this application Dec. 13, 1973, Ser. No. 428,342
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D55—1 B

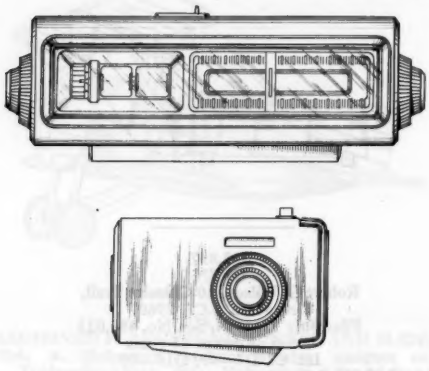


238,897
OVEN
Robert G. Wilson, 10 Chisolm Trail, Greenville, S.C. 29607
Filed July 12, 1974, Ser. No. 488,023
Term of patent 14 years
Int. Cl. D7—*02*; D15—*08*
U.S. Cl. D55—1 E

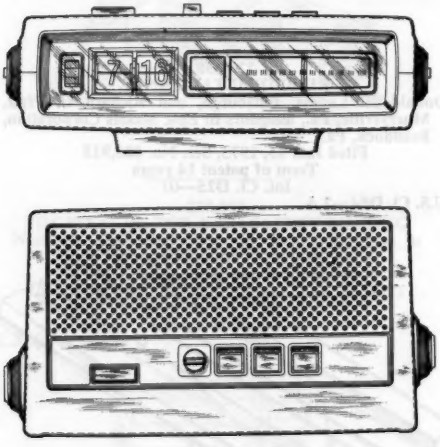


238,898
RIBBED METAL PANEL
Donald H. Landis, Pittsburgh, and Richard C. Pfaff, Murrysville, Pa., assignors to Epic Metals Corporation, Braddock, Pa.
Filed Jan. 15, 1973, Ser. No. 323,912
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D54—2 A

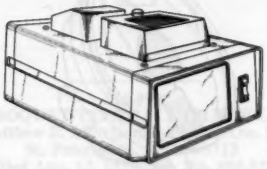
238,899
CLOCK RADIO
Cornelius W. Christie, Jr., Fulton, and John T. Houlihan, and George M. Buckler, Fayetteville, N.Y., assignors to General Electric Company, Syracuse, N.Y.
Filed Jan. 7, 1974, Ser. No. 431,290
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



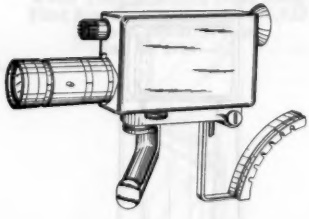
238,900
CLOCK RADIO
Cornelius W. Christie, Jr., Fulton, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Filed Apr. 8, 1974, Ser. No. 458,578
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



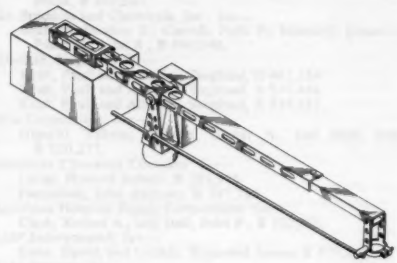
238,901
VIEWER-MAGNIFIER TO INSPECT SKIN PRINTS TO DETERMINE CONDITION OF THE SKIN FOR COSMETIC PURPOSES
Isozo Yoshida, Tokyo, Japan, assignor to Kanebo Ltd.
Filed Sept. 11, 1973, Ser. No. 396,294
Claims priority, application Japan Mar. 12, 1973
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 J

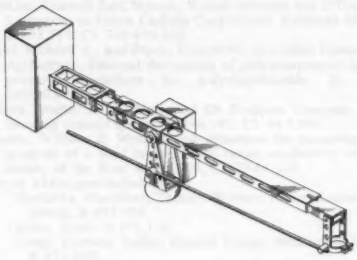


238,902
MOTION PICTURE CAMERA OR SIMILAR ARTICLE
Peter Hartwein, Schwalbach, Germany, assignor to Braun Aktiengesellschaft, Frankfurt, am Main, Germany
Filed Feb. 22, 1974, Ser. No. 445,297
Claims priority, application Germany Sept. 2, 1973
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 B

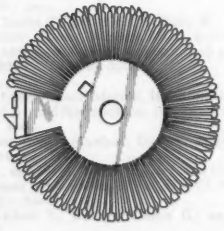


238,903
CAMERA BOOM
Vance D. Colvig, Los Angeles, Calif., assignor to Circle One Incorporated, Hollywood, Calif.
Filed Apr. 8, 1974, Ser. No. 458,811
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 G

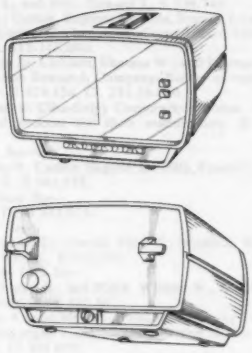




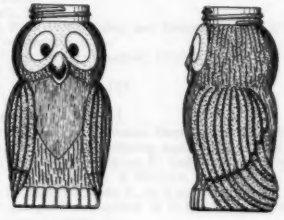
238,904
CHARACTER PRINT MEMBER
Roy J. Lahr, Sierra Madre, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 6, 1973, Ser. No. 422,392
Term of patent 14 years
The portion of the term of the patent subsequent to Feb. 24, 1990, has been disclaimed
Int. Cl. D18—*99*
U.S. Cl. D64—11 R



238,905
BEDSIDE MONITOR
Michael L. Sokol, Littleton, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed May 6, 1974, Ser. No. 467,438
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F



238,906
INFANT FEEDING BOTTLE
Richard E. Cone II, 249 Bowman Drive, Kent, Ohio 44240
Filed Oct. 16, 1974, Ser. No. 515,180
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D83—8 A



238,907
TOOTHPICK OR SIMILAR ARTICLE
Sigurd Walter Bengtsson, Bruksgatan 17, Goteborg, Sweden
Filed Nov. 7, 1973, Ser. No. 413,449
Claims priority, application Sweden May 16, 1973
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 D

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Kraft, Paul; and Altscher, Siegfried, B 519,487.

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Higuchi, Takeru; Hussain, Anwar A.; and Shell, John W., B 520,277.

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Pankavich, John Anthony, B 587,786.

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Aoki, Shigeru: *See*—
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Shono, Tetsuji, B 515,135.

Atkins, Kenneth Earl; Manyik, Robert Michael; and O'Connor, George Lawrence, to Union Carbide Corporation. Synthesis of alkadienols. B 553,584, Cl. 260-632.00R.

Awl, Richard A.; and Pryde, Everett H., to United States of America, Agriculture. Diacetal derivatives of polyunsaturated fatty esters as primary plasticizers for polyvinylchloride. B 485,060, Cl. 260-30.40R.

Bajek, Walter A., to Universal Oil Products Company. Motor fuel blending control system. B 496,792, Cl. 44-2.000.

Banks, William B. Method and apparatus for measuring a physical property of a fluid material that varies nonlinearly relative to the density of the fluid. B 511,909, Cl. 73-61.10R.

Bayer Aktiengesellschaft: *See*—
Boehmke, Guenther; Theuer, Werner; Nonn, Konrad; and Pape, Georg, B 495,903.
Botta, Artur, B 471,116.
Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, B 452,938.
Pantke, Hellmuth; and Vogel, Karl, B 354,959.

Bechara, Ibrahim S.; Carroll, Felix P.; Mascioli, Rocco L.; and Panchak, John R., to Air Products and Chemicals, Inc. Cyclic quaternary hydroxyalkyl phenoxide catalysts for isocyanate reactions. B 490,946, Cl. 260-268.0BF.

Beck, James Richard, to Eli Lilly and Company. [1]Benzothieno[3,2-b]furans. B 574,996, Cl. 260-330.500.

Becker, John E., to Cluaran Associates Limited. Fluid clutches. B 541,464, Cl. 60-349.000.

Beffa, Fabio: *See*—
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Ross, David Gene; and Schnitzler, Paul, B 530,813.

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Bessmer, Stanley J.; and Lampe, Warren R., to General Electric Company. Method of forming a roofing composite using silicone rubber composition. B 537,085, Cl. 427-186.000.

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Britt, Edward J.: *See*—
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Brown, Henry B.; Cantor, Eugene; DeTolla, Francis L.; and Vollinger, Gary J., to United Technologies Corporation. Turbine cooling. B 561,712, Cl. 415-115.000.

Burkhardt, Joseph A.; Childers, Thomas W.; and Koerner, Roger J., to Exxon Production Research Company. Rotary motion failsafe gate valve actuator. B 429,434, Cl. 251-58.000.

Buxbaum, Lothar, to Ciba-Geigy Corporation. Linear, thermpolastic polyesters and process for their manufacture. B 521,127, Cl. 260-75.00N.

Cantor, Eugene: *See*—
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Carrier Corporation: *See*—
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Champoux, Louis A.; and Merrell, Hollis B., to Boeing Company, The. Single operation-triple cycle lockbolt setting device and system. B 516,537, Cl. 72-391.000.

Channin, Donald Jones, to RCA Corporation. Liquid crystal display. B 527,054, Cl. 350-160.0LC.

Chen, Joseph L. P.; and Archer, David H., to United States of America, Energy Research and Development Administration. Agglomerating combustor-gasifier method and apparatus for coal gasification. B 541,376, Cl. 48-73.000.

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Chiotti, Premo; and Jha, Mahesh Chandra, to United States of America, Energy Research and Development Administration. Separation of uranium from $(Th,U)O_2$ solid solutions. B 538,491, Cl. 75-84.10R.

Chong, Clyde H. H.; Love, Calvin M.; Prisc, Martin D.; and Russo, Alexander J., to United States of America, Energy Research and Development Administration. High purity polonium recovery. B 402,553, Cl. 423-249.000.

Ciba-Geigy AG: *See*—
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Clark, Robert A.; and Hall, John P., to American Hospital Supply Corporation. Organ perfusion system. B 522,009, Cl. 62-306.000.

Cluaran Associates Limited: *See*—
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Cohen, Georges: *See*—
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Conn, William Maxwell, to Universal Oil Products Company. Precoat for permeability separation systems. B 364,797, Cl. 210-23.00H.

Corte, Herbert; Heller, Harold; Lange, Michael; and Netz, Otto, to Bayer Aktiengesellschaft. Resins for separating heavy metals consisting of thiourea-group-containing macroporous vinyl aromatic cross-linked matrixes. B 452,938, Cl. 75-101.0BE.

Crofton, John Walter, to Deering Milliken Research Corporation. Wet mop construction having pile fabric mopping element. B 523,885, Cl. 15-229.00A.

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den Hollander, Willem, to RCA Corporation. Gating circuit for thyristor deflection system. B 516,564, Cl. 315-408.000.

Deno, Norman C.; and Spinelli, Harry J., to Research Corporation. Photochlorination of alkanols. B 550,744, Cl. 204-158.0HA.

DeTolla, Francis L.: *See—*
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Duriron Company, Inc., The: *See—*
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Ebnother, Anthon, to Sandoz Ltd. 9-(4-Piperidylidene)thioxanthenes. B 426,802, Cl. 260-293.570.

Eckardt, Peter, to Hoechst Aktiengesellschaft. Process for preparing filaments, fibers and sheets of aromatic polyamides. B 451,308, Cl. 260-78.00S.

Eernisse, Errol P.; and Peterson, Gary D., to United States of America, Energy Research & Development Administration. Variable gas leak rate valve. B 534,333, Cl. 251-129.000.

Ekstam, Martin Rudolf, to AB Stathmos. Method and an apparatus for cleaving slaughtered carcasses. B 519,599, Cl. 17-23.000.

Ekstrom, Thomas E.; and Koch, Richard L., to General Electric Company. Marine propulsion system. B 477,597, Cl. 290-17.000.

Eli Lilly and Company: *See—*
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Exxon Production Research Company: *See—*
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Frank, Arlen W.; and Drake, George L., Jr., to United States of America, Agriculture. Quaternary arylaminoalkyl phosphonium salts. B 529,974, Cl. 260-568.000.

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Lucek, John R.; and Palen, Vernon B., B 517,858.

Gerhold, Clarence George, to Universal Oil Products Company. Effluent fractionation in simulated moving-bed adsorption processes. B 494,944, Cl. 260-274.0SA.

Gestetner Byfleet Limited: *See—*
Mihalik, Nandor; and Frostick, Terence Cunningham, B 509,474.

Globe-Union Inc.: *See—*
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Grasso, Albert P., to United Technologies Corporation. Fuel cell stack with an integral ejector for reactant gas recirculation. B 574,128, Cl. 136-86.00R.

Green, Philip S., to Stanford Research Institute. Composite acoustic lens. B 270,274, Cl. 340-8.00L.

Gross, James R., to Dow Chemical Company, The. Absorbent articles made from carboxylic polyelectrolyte solutions containing bis-oxazoline crosslinker and methods for their preparation. B 494,440, Cl. 260-29.60N.

Gross, James Richard, to Dow Chemical Company, The. Absorbent articles made from latexes of carboxylic synthetic polelectrolyte containing n-substituted acrylamide crosslinking agent. B 494,450, Cl. 260-29.6TA.

Guadagna, John P.: *See—*
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Gysling, Henry J., to Eastman Kodak Company. Photosensitive copper (I) complexes. B 518,656, Cl. 260-438.100.

Haig-Arbib, Daniel, to National Research Development Corporation. Noise dosemeter. B 523,080, Cl. 73-557.000.

Hall, John P.: *See—*
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Harris, Edward M.: *See—*
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Hart, Charles Richard; and Nield, Eric, to Imperial Chemical Industries Ltd. Transparent rubber-containing blend of acrylonitrile/aromatic olefin resin. B 580,826, Cl. 260-876.00R.

Heller, Harold: *See—*
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Hendrickson, Iver Glen: *See—*
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Hervert, George L., to Universal Oil Products Company. Monolithic honeycomb form electric heating device. B 513,027, Cl. 219-553.000.

Higo, Nobumasa, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Liquid level detector. B 453,533, Cl. 200-84.00C.

Higuchi, Takeru; Hussain, Anwar A.; and Shell, John W., to Alza Corporation. Ocular insert. B 520,277, Cl. 128-260.000.

Hoechst Aktiengesellschaft: *See—*
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Holzinger, Charles E.; and Blake, William W., to Caterpillar Tractor Co. Transmission control system with improved modulating valve. B 548,719, Cl. 192-3.570.

Hussain, Anwar A.: *See—*
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Hutchings, Le Roi E., to Universal Oil Products Company. Hydrocracking process for the maximization of an improved viscosity lube oil. B 508,118, Cl. 208-59.000.

Hutchings, Le Roi E., to Universal Oil Products Company. Process for the conversion of hydrocarbonaceous black oil. B 508,119, Cl. 208-208.00R.

Ilvespaa, Atso, to Ciba-Geigy Corporation. 4-or 5-Nitroimidazoles and processes for their manufacture. B 522,567, Cl. 260-309.200.

Imperial Chemical Industries Ltd.: *See—*
Hart, Charles Richard; and Nield, Eric, B 580,826.
Nicks, Peter Francis; Osborn, Peter George; Thompson, Morice William; and James, Patricia Lesley, B 479,175.

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Johnson, William S., to International Business Machines. Improved semiconductor devices. B 516,060, Cl. 357-23.000.

Juguin, Bernard; Cohen, Georges; and Mikitenko, Paul, to Institut Francais du Petrole. Process for manufacturing and separating from petroleum cuts aromatic hydrocarbons of high purity. B 430,157, Cl. 260-668.00D.

Kahn, David; and Geckle, Raymond James, to AMP Incorporated. Ceramic binder for polyconductor powders. B 479,242, Cl. 252-500.000.

Kessler, Hans-Joachim: *See—*
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Koch, Richard L.: *See—*
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Koerner, Roger J.: *See—*
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Kraft, Paul; and Altscher, Siegfried, to Stauffer Chemical Company. Fire retardant thermoplastic polymer compositions. B 461,184, Cl. 260-876.00R.

Kraft, Paul; and Altscher, Siegfried, to Stauffer Chemical Company. Fire retardant thermoplastic polymer compositions. B 519,486, Cl. 260-873.000.

Kraft, Paul; and Altscher, Siegfried, to Stauffer Chemical Company. Fire retardant thermoplastic polymer compositions. B 519,487, Cl. 260-17.00R.

Kristiansen, Odd: *See—*
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Kuhne, Manfred, to Ciba-Geigy Corporation. Silylated chloroacetanilides for the regulation of plant growth. B 551,463, Cl. 260-448.20N.

Kurz, Philip F.: *See—*
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Lampe, Warren R.: *See—*
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Laridon, Urbain Leopold; Poot, Albert Lucien; and Willems, Jozef Frans, to AGFA-GEVAERT N.V. Thermographic recording process. B 457,547, Cl. 427-145.000.
Lattin, Kenneth R.; and Erickson, Gerald L., to United States of America, Energy Research and Development Administration. Method and means of monitoring the effluent from nuclear facilities. B 526,190, Cl. 250-364.000.
Lausch, Heinz, to J. M. Voith, GmbH. Treatment of waste paper, especially to effect the recovery of clean fibers therefrom. B 491,673, Cl. 162-5.000.
Leogrande, Antonio: *See—*
Rudolph, Gunther; Schelzke, Erhard; and Leogrande, Antonio, B 411,471.
Lienhard, Paul; Beffa, Fabio; and Soiron, Charles, to Ciba-Geigy AG. Betainic azo dyestuffs containing cobalt in complex union with a colorless, tridentate ligand. B 383,697, Cl. 260-147.000.
Love, Calvin M.: *See—*
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Lucek, John R.; and Palen, Vernon B., to General Electric Company. Centrifugally casting hollow glass body around vapor shield. B 517,858, Cl. 65-49.000.
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Massie, Stephen N., to Universal Oil Products Company. Production of pyromellitic dianhydride. B 485,051, Cl. 260-346.400.
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Maxted, Wesley R.; and Woltjer, Bernard H., to Rapistan Incorporated. Conveyor diverter. B 495,402, Cl. 198-38.000.
McNally, George J., to Weston Chemical Corporation. Thiophosphites and ultraviolet light stabilizer for olefin polymers. B 054,859, Cl. 260-23.00H.
Mecham, William J., to United States of America, Energy Research and Development Administration. Method for storage of solid waste. B 548,058, Cl. 252-301.10W.
Merrell, Hollis B.: *See—*
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Mihalik, Nandor; and Frostick, Terence Cunningham, to Gestetner Byfleet Limited. In or relating to scanning lens systems for electrostatic copying machines. B 509,474, Cl. 355-8.000.
Mikitenko, Paul: *See—*
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Mikulicz, Michael Z.; Boney, William G.; and Vora, Bipin V., to Universal Oil Products Company. Recovery of hydrogen fluoride from waste gases. B 526,027, Cl. 260-683.480.
Mueller, Hans W.; and Shattuck, Richard E., to SCM Corporation. Typing machine key action. B 501,122, Cl. 197-17.000.
Nakano, Yasuo: *See—*
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National Research Development Corporation: *See—*
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Nicks, Peter Francis; Osborn, Peter George; Thompson, Morice William; and James, Patricia Lesley, to Imperial Chemical Industries Limited. Process for the production of a dispersion of condensation polymer particles containing a modifying agent. B 479,175, Cl. 260-33.60R.
Nield, Eric: *See—*
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Nonn, Konrad: *See—*
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O'Connor, George Lawrence: *See—*
Atkins, Kenneth Earl; Manyik, Robert Michael; and O'Connor, George Lawrence, B 553,584.
Ooba, Yasumi. Apex seal device for use in rotary piston engine. B 515,216, Cl. 277-81.00P.
Oosterhof, Jan, to U.S. Philips Corporation. Device for spreading granules. B 520,534, Cl. 239-652.000.
Osborn, Peter George: *See—*
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Overholser, Lyle G.; Masters, David R.; and Napier, John M., to United States of America, Energy Research and Development Administration. High strength graphite and method for preparing same. B 414,028, Cl. 423-448.000.
Owens-Illinois, Inc.: *See—*
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Oxford Laboratories Inc.: *See—*
Reed, Richard Dean; and Branham, Doud Roger, B 497,853.
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Pankavich, John Anthony, to American Cyanamid Company. Method of using benzopyrans as antiparasitic agents. B 587,786, Cl. 424-281.000.
Pantke, Hellmuth; and Vogel, Karl, to Bayer Aktiengesellschaft. Agents for improving wet fastness properties. B 354,959, Cl. 8-74.000.
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Phillips Petroleum Company: *See—*
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Pollock, Charles W., to United States of America, Energy Research and Development Administration. Recovery of boric acid from ion exchangers. B 521,984, Cl. 423-283.000.
Poot, Albert Lucien: *See—*
Laridon, Urbain Leopold; Poot, Albert Lucien; and Willems, Jozef Frans, B 457,547.
Porter, Townsend Henry, Jr.: *See—*
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Powers, John J.; and Thibodeau, Joseph R., to Sigma Instruments, Inc. Condition-initiated load control circuit. B 527,187, Cl. 317-124.000.
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Rapistan Incorporated: *See—*
Maxted, Wesley R.; and Woltjer, Bernard H., B 495,402.
Rasor, Ned S.; and Britt, Edward J., to United States of America, Energy Research and Development Administration. Thermionic converter. B 539,746, Cl. 310-4.00R.
RCA Corporation: *See—*
Channin, Donald Jones, B 527,054.
den Hollander, Willem, B 516,564.
Phillips, Kevin John, B 423,441.
Reed, Richard Dean; and Branham, Doud Roger, to Oxford Laboratories Inc. Volume setting mechanism for fluid discharge devices. B 497,853, Cl. 222-43.000.
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Risse, John T.; and Taggart, James C., to United States of America, Energy Research and Development Administration. Vehicle fuel system. B 508,940, Cl. 137-255.000.
Rosenkranz, Hans-Jurgen; Rudolph, Hans; Wolff, Erich; and von Rintelen, Harald, to Agfa-Gevaert Aktiengesellschaft. Polymers which can be cross-linked by photopolymerisation. B 530,873, Cl. 96-35.100.
Ross, David Gene; and Schnitzler, Paul, to Bell Telephone Laboratories, Incorporated. Class AB-dual push-pull amplifier. B 530,813, Cl. 330-15.000.
Roy, Kenneth Lee, to Globe-Union Inc. Push button switch mode indicator element. B 469,228, Cl. 116-124.00L.
Rudolph, Gunther; Schelzke, Erhard; and Leogrande, Antonio, to Vereinigte Deutsche Metallwerke AG. Brass alloy. B 411,471, Cl. 75-156.500.

Rudolph, Hans: *See—*
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Rufer, Clemens; and Kessler, Hans-Joachim, to Schering Aktiengesellschaft. Amino-substituted nitroimidazolylmethyleneaminoimidazolidinones. B 484,067, Cl. 260-240.00A.
Russo, Alexander J.: *See—*
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Salger, Werner, to Lumoprint Zindler KG. Developing device for electrophotographic copying machines. B 563,301, Cl. 118-637.000.
Sandoz Ltd.: *See—*
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Schelzke, Erhard: *See—*
Rudolph, Gunther; Schelzke, Erhard; and Leogrande, Antonio, B 411,471.
Schering Aktiengesellschaft: *See—*
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Schiel, Christian, to J. M. Voith, GmbH. Papermaking machine having a suction zone free of wire supports. B 478,739, Cl. 162-290.000.
Schmerling, Louis, to Universal Oil Products Company. Preparation of ketones. B 438,484, Cl. 260-586.00C.
Schmid, Anthony P.: *See—*
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Schnitzler, Paul: *See—*
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Schreiber, Bruno; and Diethelm, Hermann, to Ciba-Geigy Corporation. Storage-stable epoxide moulding compositions. B 423,365, Cl. 260-37.0EP.
Schreiber, Bruno; Seiz, Wolfgang; and Forster, Ewald, to Ciba-Geigy Corporation. Storage-stable, quick-curing epoxide resin moulding materials. B 489,331, Cl. 260-28.00P.
SCM Corporation: *See—*
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Seiz, Wolfgang: *See—*
Schreiber, Bruno; Seiz, Wolfgang; and Forster, Ewald, B 489,331.
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Shim, Kyung S., to Stauffer Chemical Company. Polyalkylene glycol vinyl phosphates. B 502,993, Cl. 260-929.000.
Shirai, Tadashi; Tashiro, Yasuhisa; and Aoki, Shigeru, to Nippon Kayaku Kabushiki Kaisha. Method of manufacturing optically active p-hydroxyphenylglycine. B 544,899, Cl. 260-501.120.
Shono, Tetsuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Measurement mode interlock mechanism in camera TTL light measuring system. B 515,135, Cl. 354-46.000.
Sigma Instruments, Inc.: *See—*
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Smith, Robert M., to Duriron Company, Inc., The. Polytetrafluoroethylene lip seal. B 426,819, Cl. 277-184.000.
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Lienhard, Paul; Beffa, Fabio; and Soiron, Charles, B 383,697.
Sparks, Allen K., to UOP Inc. Photodegradable polyolefin composition containing a mixture of an aryl ketone and an alkanolamine. B 596,692, Cl. 260-32.60R.
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Laridon, Urbain Leopold; Poot, Albert Lucien; and Willems, Jozef Frans, B 457,547.
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Rosenkranz, Hans-Jurgen; Rudolph, Hans; Wolff, Erich; and von Rintelen, Harald, B 530,873.
Woltjer, Bernard H.: *See—*
Maxted, Wesley R.; and Woltjer, Bernard H., B 495,402.

CLASSIFICATION OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM

DATE PUBLISHED FEBRUARY 17, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 8			
10.2	B 430,334	C	Jan. 27, 1976
14	B 460,388	C	Jan. 27, 1976
	B 497,473	C	Feb. 3, 1976
17	B 458,060	C	Jan. 13, 1976
62	B 507,476	C	Feb. 10, 1976
74	B 354,959	C	Feb. 17, 1976
84	B 495,903	C	Feb. 17, 1976
115.7	B 389,304	C	Jan. 27, 1976
142	B 423,867	C	Feb. 3, 1976
161	B 461,352	C	Jan. 13, 1976
174	B 344,967	C	Feb. 3, 1976
Class 15			
229A	B 523,885	M	Feb. 17, 1976
256.53	B 579,116	M	Feb. 3, 1976
Class 17			
23	B 519,599	M	Feb. 17, 1976
2502	B 541,496	E	Jan. 27, 1976
Class 21			
2.7R	B 527,999	C	Feb. 3, 1976
Class 23			
285F	B 565,180	C	Jan. 27, 1976
Class 24			
75	B 532,476	M	Feb. 3, 1976
Class 28			
1.6	B 497,292	M	Feb. 3, 1976
Class 29			
96	B 546,911	M	Jan. 13, 1976
127	B 510,855	M	Jan. 27, 1976
428	B 520,928	M	Jan. 13, 1976
578	B 561,732	M	Feb. 3, 1976
580	B 492,301	M	Jan. 13, 1976
Class 32			
10A	B 491,501	M	Jan. 13, 1976
Class 37			
8	B 558,819	M	Feb. 3, 1976
142A	B 511,099	M	Feb. 3, 1976
Class 44			
2	B 496,792	C	Feb. 17, 1976
Class 47			
57.6	B 548,028	M	Feb. 3, 1976
Class 48			
73	B 541,376	C	Feb. 17, 1976
Class 52			
207	B 459,597	M	Feb. 17, 1976
484	B 522,354	M	Jan. 20, 1976
Class 53			
77	B 508,878	M	Feb. 3, 1976
Class 55			
105	B 490,806	C	Feb. 3, 1976
352	B 543,941	C	Jan. 13, 1976
Class 56			
14.5	B 549,244	M	Jan. 27, 1976
15.9	B 558,973	M	Feb. 10, 1976
Class 58			
21.13	B 516,825	M	Feb. 3, 1976
Class 60			
226A	B 445,459	M	Feb. 3, 1976
304	B 502,540	M	Jan. 13, 1976
349	B 541,464	M	Feb. 17, 1976
422	B 526,445	M	Jan. 20, 1976
424	B 584,520	M	Jan. 27, 1976
425	B 535,386	M	Jan. 13, 1976
445	B 400,871	M	Feb. 17, 1976
592	B 465,145	M	Jan. 27, 1976
645	B 538,472	M	Feb. 3, 1976
Class 61			
.5	B 554,283	M	Jan. 27, 1976
Class 62			
306	B 522,009	M	Feb. 17, 1976
353	B 564,314	M	Jan. 20, 1976
Class 65			
3A	B 532,969	C	Jan. 13, 1976
49	B 517,858	C	Feb. 17, 1976
239	B 545,777	C	Jan. 27, 1976
Class 71			
113	B 535,076	C	Jan. 20, 1976
Class 72			
43	B 546,631	M	Feb. 3, 1976
56	B 489,290	M	Feb. 17, 1976
88	B 575,757	M	Jan. 27, 1976
391	B 516,537	M	Feb. 17, 1976
Class 73			
24	B 506,744	M	Jan. 13, 1976
29	B 557,153	M	Feb. 3, 1976
37.7	B 532,319	M	Feb. 3, 1976
61.1R	B 511,909	M	Feb. 17, 1976
67.5H	B 522,309	M	Feb. 3, 1976
147	B 521,620	M	Jan. 27, 1976
190R	B 480,350	M	Feb. 10, 1976
302	B 464,290	M	Feb. 3, 1976
437	B 528,401	M	Feb. 3, 1976
557	B 523,080	M	Feb. 17, 1976
Class 74			
242.1A	B 567,854	M	Feb. 3, 1976
243C	B 558,818	M	Jan. 13, 1976
479	B 509,586	M	Feb. 3, 1976
481	B 497,021	M	Jan. 13, 1976
527	B 470,170	M	Jan. 13, 1976
546	B 518,999	M	Feb. 3, 1976
Class 75			
.5BA	B 385,631	C	Jan. 27, 1976
84.1R	B 538,491	C	Feb. 17, 1976
101BE	B 452,938	C	Feb. 17, 1976
135	B 525,961	C	Jan. 13, 1976
156.5	B 411,471	C	Feb. 17, 1976
165	B 483,256	C	Feb. 10, 1976
Class 83			
425	B 545,935	M	Jan. 27, 1976
Class 84			
1.16	B 556,897	M	Feb. 3, 1976
275	B 504,169	M	Jan. 13, 1976
Class 86			
1R	B 356,187	M	Jan. 20, 1976
Class 96			
1R	B 423,883	C	Jan. 27, 1976
1.4	B 200,759	C	Feb. 3, 1976
35	B 524,026	C	Feb. 10, 1976
35.1	B 530,873	C	Feb. 17, 1976
36.1	B 359,901	C	Jan. 13, 1976
78	B 503,029	C	Jan. 27, 1976
Class 99			
335	B 557,299	M	Feb. 3, 1976
Class 101			
93.13	B 496,999	M	Jan. 27, 1976
93.14	B 481,600	M	Jan. 27, 1976
129	B 416,589	M	Jan. 27, 1976
401.3	B 494,234	M	Feb. 10, 1976

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		CAT.	PUB. DATE
Class 102			
32	B 405,726	M	Jan. 13, 1976
42R	B 443,163	M	Feb. 3, 1976
69	B 412,068	M	Jan. 13, 1976
Class 106			
27	B 452,883	C	Jan. 27, 1976
57	B 502,773	C	Jan. 13, 1976
309	B 311,779	C	Feb. 10, 1976
Class 109			
1SB	B 358,427	E	Feb. 3, 1976
Class 110			
8R	B 512,324	M	Feb. 17, 1976
Class 116			
124L	B 469,228	M	Feb. 17, 1976
124.4	B 467,412	M	Jan. 13, 1976
Class 118			
637	B 563,301	M	Feb. 17, 1976
Class 123			
8.45	B 570,172	M	Feb. 3, 1976
25R	B 447,440	M	Feb. 17, 1976
75B	B 563,780	M	Feb. 3, 1976
182	B 558,251	M	Jan. 13, 1976
325T	B 425,588	M	Jan. 13, 1976
Class 126			
271	B 512,745	M	Jan. 13, 1976
350A	B 537,903	M	Jan. 20, 1976
Class 128			
260	B 520,277	M	Feb. 17, 1976
	B 524,121	M	Feb. 3, 1976
419P	B 535,466	M	Jan. 27, 1976
Class 131			
144	B 586,387	M	Feb. 3, 1976
Class 136			
86R	B 505,126	C	Feb. 10, 1976
	B 574,128	C	Feb. 17, 1976
148	B 524,464	C	Feb. 10, 1976
202	B 378,513	C	Jan. 27, 1976
Class 137			
255	B 508,940	M	Feb. 17, 1976
596.12	B 514,687	M	Jan. 27, 1976
614.11	B 530,605	M	Feb. 3, 1976
625.46	B 528,756	M	Feb. 3, 1976
798	B 430,172	M	Jan. 13, 1976
Class 140			
92.1	B 590,158	M	Feb. 10, 1976
	B 590,159	M	Feb. 3, 1976
Class 144			
241	B 545,630	M	Jan. 27, 1976
Class 148			
1.5	B 518,226	C	Feb. 10, 1976
Class 152			
213R	B 445,690	M	Feb. 3, 1976
Class 156			
3	B 563,722	C	Jan. 13, 1976
71	B 456,148	C	Jan. 13, 1976
73.6	B 414,481	C	Jan. 20, 1976
143	B 462,386	C	Jan. 13, 1976
Class 160			
229R	B 505,813	M	Jan. 13, 1976
Class 162			
5	B 491,673	C	Feb. 17, 1976
133	B 431,072	C	Jan. 20, 1976
198	B 150,142	C	Jan. 27, 1976
290	B 478,739	C	Feb. 17, 1976
Class 164			
26	B 499,227	M	Jan. 27, 1976
60	B 511,885	M	Jan. 27, 1976
330	B 522,038	M	Feb. 3, 1976
Class 165			
13	B 543,078	M	Feb. 17, 1976
Class 166			
272	B 569,519	M	Feb. 3, 1976
303	B 529,836	M	Feb. 3, 1976
311	B 511,156	M	Jan. 27, 1976
Class 173			
104	B 537,709	M	Jan. 13, 1976
170	B 567,058	M	Jan. 13, 1976
Class 176			
20R	B 384,330	C	Jan. 27, 1976
36R	B 367,621	C	Feb. 3, 1976
68	B 396,164	C	Feb. 3, 1976
Class 178			
6	B 546,426	E	Jan. 27, 1976
7.1	B 519,979	E	Feb. 3, 1976
7.3D	B 442,970	E	Feb. 3, 1976
7.5R	B 508,817	E	Feb. 3, 1976
58R	B 399,908	C	Jan. 13, 1976
88	B 561,764	E	Jan. 27, 1976
Class 179			
1A	B 513,756	E	Feb. 3, 1976
1CN	B 475,681	E	Jan. 20, 1976
1SM	B 476,577	E	Jan. 20, 1976
1G	B 554,594	E	Jan. 20, 1976
7.1R	B 545,050	E	Jan. 20, 1976
15AL	B 496,500	E	Feb. 3, 1976
81R	B 472,284	E	Jan. 13, 1976
170D	B 541,415	E	Feb. 3, 1976
Class 180			
5R	B 499,171	M	Jan. 27, 1976
49	B 433,094	M	Jan. 27, 1976
53R	B 551,527	M	Jan. 13, 1976
79.2R	B 533,968	M	Jan. 27, 1976
Class 188			
73.6	B 533,056	M	Jan. 13, 1976
165	B 567,435	M	Feb. 3, 1976
218XL	B 562,698	M	Jan. 13, 1976
Class 192			
3.57	B 548,719	M	Feb. 17, 1976
Class 195			
29	B 418,489	C	Jan. 13, 1976
Class 196			
14.52	B 520,384	M	Jan. 27, 1976
Class 197			
17	B 501,122	M	Feb. 17, 1976
18	B 535,391	M	Jan. 27, 1976
Class 198			
38	B 495,402	M	Feb. 17, 1976
129	B 569,646	M	Jan. 13, 1976
179	B 424,989	M	Feb. 3, 1976
202	B 499,352	M	Jan 27, 1976
Class 200			
5R	B 579,104	E	Jan. 27, 1976
11TC	B 531,425	E	Feb. 3, 1976
38FA	B 494,383	E	Feb. 3, 1976
61.41	B 506,286	E	Jan. 20, 1976
67D	B 585,247	E	Feb. 3, 1976
83SA	B 428,877	E	Jan. 27, 1976
84C	B 453,533	E	Feb. 17, 1976
Class 202			
227	B 513,280	C	Jan. 20, 1976
Class 204			
15	B 542,135	C	Feb. 10, 1976
158HA	B 550,744	C	Feb. 17, 1976
159.18	B 498,205	C	Feb. 10, 1976
195S	B 843,038	C	Feb. 3, 1976
224M	B 534,314	C	Feb. 10, 1976
Class 206			
455	B 490,067	M	Jan. 27, 1976
Class 208			
15	B 437,596	C	Jan. 27, 1976
59	B 508,118	C	Feb. 17, 1976
78	B 467,250	C	Feb. 3, 1976
208R	B 508,119	C	Feb. 17, 1976
210	B 501,317	C	Jan. 13, 1976
253	B 438,916	C	Jan. 13, 1976
Class 210			
23H	B 364,797	C	Feb. 17, 1976
130	B 532,901	C	Jan. 13, 1976

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Class 214			
18N	B 373,344	M	Feb. 3, 1976
58	B 555,772	M	Jan. 13, 1976
152	B 480,604	M	Jan. 13, 1976
Class 215			
216	B 541,015	M	Jan. 27, 1976
Class 219			
233	B 463,388	E	Feb. 10, 1976
273	B 403,507	E	Feb. 10, 1976
553	B 513,027	E	Feb. 17, 1976
Class 220			
23.83	B 529,156	M	Jan. 13, 1976
288	B 516,032	M	Jan. 27, 1976
337	B 578,447	M	Jan. 20, 1976
Class 222			
43	B 497,853	M	Feb. 17, 1976
67	B 521,480	M	Jan. 13, 1976
136	B 487,260	M	Jan. 27, 1976
306	B 559,954	M	Feb. 3, 1976
325	B 515,303	M	Jan. 20, 1976
Class 226			
68	B 506,926	M	Feb. 17, 1976
Class 228			
190	B 473,972	M	Jan. 13, 1976
Class 229			
2.5	B 537,990	M	Jan. 13, 1976
17R	B 461,257	M	Jan. 13, 1976
62.5	B 429,157	M	Jan. 27, 1976
Class 235			
151.34	B 492,946	E	Jan. 27, 1976
152	B 559,737	E	Jan. 20, 1976
154	B 534,016	E	Feb. 3, 1976
156	B 536,009	E	Jan. 27, 1976
181	B 520,924	E	Jan. 27, 1976
Class 236			
15A	B 558,813	M	Feb. 3, 1976
Class 239			
424	B 580,921	M	Jan. 13, 1976
424	B 586,215	M	Jan. 20, 1976
652	B 520,534	M	Feb. 17, 1976
Class 240			
41.35R	B 454,283	E	Feb. 3, 1976
Class 242			
43R	B 521,600	M	Jan. 27, 1976
129.8	B 506,167	M	Feb. 10, 1976
Class 244			
134R	B 535,928	M	Jan. 13, 1976
169	B 423,441	M	Feb. 17, 1976
	B 511,346	M	Jan. 27, 1976
Class 248			
73	B 494,806	M	Feb. 3, 1976
Class 249			
135	B 548,155	M	Jan. 13, 1976
Class 250			
210	B 515,908	E	Jan. 20, 1976
227	B 522,577	E	Jan. 27, 1976
	B 560,765	E	Feb. 3, 1976
291	B 500,981	E	Jan. 27, 1976
364	B 526,190	E	Feb. 17, 1976
402	B 451,534	E	Jan. 13, 1976
577	B 507,396	E	Feb. 10, 1976
Class 251			
58	B 429,434	M	Feb. 17, 1976
129	B 534,333	M	Feb. 17, 1976
319	B 490,589	M	Feb. 3, 1976
Class 252			
182	B 471,405	C	Feb. 10, 1976
301.1W	B 548,058	C	Feb. 17, 1976
301.4S	B 535,813	C	Jan. 27, 1976
364	B 370,309	C	Jan. 20, 1976
429R	B 457,850	C	Feb. 10, 1976
432	B 509,640	C	Feb. 17, 1976
454	B 450,967	C	Jan. 13, 1976
500	B 479,242	C	Feb. 17, 1976
518	B 585,731	C	Feb. 3, 1976
543	B 403,766	C	Feb. 10, 1976
Class 254			
186R	B 511,407	M	Feb. 10, 1976
188	B 437,559	M	Feb. 3, 1976
Class 259			
4	B 486,614	N	Feb. 17, 1976
191	B 556,057	M	Jan. 13, 1976
Class 260			
2.5AC	B 497,194	C	Feb. 3, 1976
	B 537,102	C	Jan. 13, 1976
2.5AJ	B 557,856	C	Feb. 10, 1976
2.5AM	B 422,063	C	Feb. 3, 1976
2.5AR	B 483,606	C	Jan. 27, 1976
	B 502,589	C	Jan. 27, 1976
2.5AV	B 460,441	C	Jan. 13, 1976
2.5AW	B 483,762	C	Feb. 10, 1976
2.5R	B 471,579	C	Jan. 13, 1976
17R	B 510,998	C	Feb. 10, 1976
	B 519,487	C	Feb. 17, 1976
18TN	B 528,303	C	Feb. 10, 1976
23H	B054,859	C	Feb. 17, 1976
23XA	B 483,865	C	Jan. 13, 1976
28P	B 489,331	C	Feb. 17, 1976
28.5AS	B 501,540	C	Jan. 13, 1976
29.2EP	B 526,997	C	Jan. 13, 1976
29.2TN	B 414,266	C	Feb. 10, 1976
29.6N	B 494,440	C	Feb. 17, 1976
29.6TA	B 494,450	C	Feb. 17, 1976
30.4R	B 485,060	C	Feb. 17, 1976
32.6R	B 596,692	C	Feb. 17, 1976
33.6AQ	B 657,438	C	Jan. 20, 1976
33.6R	B 479,175	C	Feb. 17, 1976
37EP	B 423,365	C	Feb. 17, 1976
	B 441,605	C	Feb. 3, 1976
37R	B 465,955	C	Feb. 3, 1976
42.15	B 415,122	C	Feb. 10, 1976
45.75W	B 561,387	C	Feb. 10, 1976
45.8N	B 506,648	C	Feb. 3, 1976
45.85R	B 236,342	C	Feb. 10, 1976
47EP	B 440,633	C	Feb. 10, 1976
75N	B 521,125	C	Feb. 10, 1976
	B 521,126	C	Feb. 10, 1976
	B 521,127	C	Feb. 17, 1976
	B 521,128	C	Feb. 10, 1976
	B 552,489	C	Feb. 10, 1976
77.5CR	B 306,668	C	Feb. 3, 1976
78.5R	B 437,209	C	Feb. 3, 1976
78S	B 451,308	C	Feb. 17, 1976
88.2C	B 417,014	C	Jan. 13, 1976
112.5R	B 471,617	C	Feb. 10, 1976
	B 503,817	C	Jan. 13, 1976
140R	B 503,579	C	Feb. 10, 1976
147	B 383,697	C	Feb. 17, 1976
239A	B 349,370	C	Jan. 27, 1976
239D	B 520,256	C	Jan. 13, 1976
	B 536,935	C	Jan. 13, 1976
239.1	B 538,753	C	Feb. 10, 1976
239.3A	B 506,148	C	Feb. 3, 1976
240A	B 484,067	C	Feb. 17, 1976
243C	B 473,039	C	Feb. 10, 1976
	B 473,040	C	Feb. 10, 1976
	B 516,047	C	Feb. 10, 1976
	B 516,296	C	Feb. 3, 1976
	B 526,096	C	Feb. 3, 1976
244R	B 348,433	C	Feb. 3, 1976
247.7T	B 468,052	C	Feb. 10, 1976
248NS	B 537,711	C	Jan. 13, 1976
250BC	B 491,883	C	Feb. 3, 1976
256.5R	B 531,096	C	Feb. 10, 1976
268BF	B 490,946	C	Feb. 17, 1976
274SA	B 494,944	C	Feb. 17, 1976
285.5	B 530,318	C	Jan. 13, 1976
293.54	B 545,464	C	Feb. 10, 1976
293.56	B 447,000	C	Feb. 3, 1976
293.57	B 426,802	C	Feb. 17, 1976
294.8D	B 526,510	C	Jan. 20, 1976
295.5B	B 458,617	C	Feb. 3, 1976
296R	B 477,252	C	Jan. 13, 1976
306.7C	B 385,024	C	Feb. 10, 1976
307D	B 486,280	C	Feb. 3, 1976
308A	B 488,111	C	Jan. 13, 1976
309.2	B 522,567	C	Feb. 17, 1976
	B 542,158	C	Jan. 13, 1976
326R	B 398,084	C	Feb. 3, 1976
326.5B	B 276,026	C	Feb. 3, 1976
326.5FN	B 484,269	C	Feb. 10, 1976
326.9	B 477,481	C	Feb. 3, 1976
327C	B 480,452	C	Feb. 10, 1976
330.5	B 552,498	C	Jan. 13, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
	B 574,996	C	Feb. 17, 1976
343.2R	B 491,032	C	Feb. 10, 1976
343.3	B 536,675	C	Jan. 20, 1976
343.3R	B 495,550	C	Feb. 3, 1976
	B 495,554	C	Feb. 3, 1976
346.2M	B 440,858	C	Feb. 3, 1976
	B 302,160	C	Feb. 3, 1976
346.4	B 485,051	C	Feb. 17, 1976
348.5L	B 521,324	C	Jan. 27, 1976
348.6	B 546,295	C	Jan. 20, 1976
378	B 431,713	C	Feb. 10, 1976
429.7	B 464,587	C	Feb. 3, 1976
438.1	B 518,656	C	Feb. 17, 1976
448.2H	B 390,408	C	Feb. 3, 1976
448.2N	B 551,463	C	Feb. 17, 1976
465.5R	B 747,785	C	Feb. 10, 1976
465.9	B 456,900	C	Feb. 3, 1976
471R	B 385,483	C	Feb. 17, 1976
	B 388,521	C	Jan. 13, 1976
472	B 472,256	C	Jan. 13, 1976
501.12	B 544,899	C	Feb. 17, 1976
513R	B 494,669	C	Feb. 3, 1976
515A	B 390,031	C	Jan. 13, 1976
516	B 386,828	C	Feb. 3, 1976
534R	B 301,143	C	Jan. 27, 1976
544C	B 471,116	C	Feb. 17, 1976
554	B 529,974	C	Feb. 17, 1976
557R	B 386,257	C	Feb. 3, 1976
566A	B 513,014	C	Feb. 10, 1976
568	B 529,974	C	Feb. 17, 1976
580	B 503,742	C	Feb. 17, 1976
586C	B 438,484	C	Feb. 17, 1976
593R	B 468,350	C	Jan. 13, 1976
601R	B 208,916	C	Jan. 13, 1976
604HF	B 472,241	C	Feb. 17, 1976
609E	B 474,573	C	Jan. 20, 1976
621K	B 470,348	C	Jan. 13, 1976
632R	B 553,584	C	Feb. 17, 1976
647	B 394,248	C	Jan. 27, 1976
648F	B 330,736	C	Feb. 3, 1976
668D	B 430,157	C	Feb. 17, 1976
674SA	B 426,274	C	Jan. 20, 1976
683.15D	B 428,103	C	Feb. 10, 1976
683.48	B 526,027	C	Feb. 17, 1976
859R	B 519,485	C	Feb. 10, 1976
873	B 465,688	C	Jan. 27, 1976
	B 519,486	C	Feb. 17, 1976
876B	B 575,851	C	Feb. 10, 1976
876R	B 589,966	C	Feb. 17, 1976
	B 461,184	C	Feb. 17, 1976
	B 580,826	C	Feb. 17, 1976
	B 589,966	C	Feb. 17, 1976
880B	B 510,458	C	Feb. 10, 1976
884	B 456,579	C	Feb. 10, 1976
890	B 495,408	C	Feb. 3, 1976
929	B 502,993	C	Feb. 17, 1976
937	B 512,373	C	Feb. 10, 1976
940	B 496,430	C	Feb. 10, 1976
942	B 386,673	C	Feb. 3, 1976
948	B 534,591	C	Feb. 17, 1976
Class 261			
39A	B 562,462	C	Jan. 13, 1976
98	B 480,702	C	Jan. 27, 1976
Class 264			
36	B 308,659	C	Jan. 27, 1976
51	B 506,144	C	Feb. 10, 1976
	B 508,369	C	Jan. 13, 1976
161	B 555,437	C	Feb. 3, 1976
225	B 453,759	C	Jan. 27, 1976
Class 274			
37	B 526,388	M	Feb. 3, 1976
Class 277			
27	B 544,034	M	Feb. 17, 1976
81P	B 515,216	M	Feb. 17, 1976
184	B 426,819	M	Feb. 17, 1976
Class 280			
150.5	B 583,051	M	Feb. 3, 1976
236	B 572,642	M	Feb. 10, 1976
Class 290			
17	B 477,597	E	Feb. 17, 1976
Class 293			
71P	B 552,932	M	Feb. 3, 1976
Class 296			
35R	B 443,647	M	Feb. 17, 1976
	B 463,671	M	Jan. 13, 1976
Class 298			
35M	B 510,588	M	Jan. 27, 1976
Class 305			
27	B 506,566	M	Jan. 20, 1976
Class 307			
88.3	B 540,872	E	Jan. 20, 1976
137	B 466,444	E	Jan. 20, 1976
205	B 513,368	E	Feb. 3, 1976
232	B 540,078	E	Jan. 13, 1976
251	B 548,302	E	Feb. 17, 1976
255	B 492,688	E	Jan. 20, 1976
270	B 497,960	E	Jan. 20, 1976
293	B 519,932	E	Feb. 3, 1976
296	B 512,849	E	Feb. 3, 1976
Class 310			
4R	B 539,746	E	Feb. 17, 1976
9.6	B 501,482	E	Jan. 13, 1976
41	B 561,784	E	Jan. 27, 1976
155	B 592,143	C	Jan. 27, 1976
Class 313			
42	B 534,443	E	Jan. 27, 1976
60	B 513,706	M	Jan. 13, 1976
99	B 518,859	E	Feb. 3, 1976
273	B 531,929	E	Jan. 20, 1976
366	B 515,455	E	Jan. 27, 1976
404	B 523,696	E	Jan. 13, 1976
452	B 160,045	E	Jan. 13, 1976
477	B 279,969	E	Jan. 13, 1976
Class 315			
169TV	B 463,322	E	Jan. 20, 1976
371	B 483,615	E	Jan. 27, 1976
388	B 516,002	E	Jan. 13, 1976
399	B 467,971	E	Jan. 13, 1976
408	B 516,564	E	Feb. 17, 1976
Class 317			
9R	B 488,634	E	Jan. 20, 1976
120	B 527,187	E	Feb. 17, 1976
124	B 509,606	E	Feb. 3, 1976
259	B 506,461	E	Jan. 20, 1976
Class 318			
139	B 475,236	E	Feb. 3, 1976
231	B 511,886	E	Feb. 3, 1976
257	B 502,973	E	Jan. 27, 1976
Class 321			
2	B 533,734	E	Jan. 27, 1976
7	B 509,185	E	Feb. 3, 1976
61	B 495,759	E	Feb. 3, 1976
Class 323			
1	B 430,276	E	Jan. 20, 1976
17	B 459,811	E	Jan. 20, 1976
	B 583,089	E	Jan. 27, 1976
22T	B 501,181	E	Feb. 10, 1976
Class 324			
13	B 079,099	E	Jan. 13, 1976
51	B 534,767	E	Feb. 3, 1976
60C	B 540,218	E	Feb. 10, 1976
62	B 465,393	E	Jan. 27, 1976
Class 325			
40	B 558,220	E	Jan. 27, 1976
468	B 544,961	E	Jan. 13, 1976
Class 328			
129	B 078,315	E	Feb. 10, 1976
155	B 550,693	E	Jan. 20, 1976
Class 330			
15	B 530,813	E	Feb. 17, 1976
33	B 439,542	E	Jan. 27, 1976
207P	B 553,460	E	Feb. 3, 1976
Class 331			
44ST	B 527,669	E	Jan. 13, 1976
51	B 538,686	E	Jan. 13, 1976
94.5C	B 549,931	E	Jan. 20, 1976
94.5L	B 506,916	E	Feb. 3, 1976
94.5P	B 394,350	E	Jan. 13, 1976
116R	B 527,693	E	Feb. 3, 1976
Class 332			
9R	B 507,087	E	Feb. 17, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 333			
30R	B 453,616	E	Jan. 27, 1976
31A	B 568,770	E	Feb. 10, 1976
72	B 534,991	E	Jan. 27, 1976
73W	B 339,194	E	Feb. 3, 1976
Class 335			
210	B 541,517	E	Jan. 13, 1976
253	B 515,452	E	Feb. 10, 1976
Class 338			
166	B 489,526	E	Feb. 3, 1976
202	B 528,761	E	Feb. 10, 1976
Class 340			
8L	B 270,274	E	Feb. 17, 1976
172.5	B 461,336	E	Feb. 3, 1976
	B 482,907	E	Jan. 20, 1976
173R	B 545,945	M	Jan. 27, 1976
174DC	B 443,712	E	Jan. 27, 1976
174TF	B 429,018	C	Feb. 10, 1976
	B 455,425	E	Feb. 3, 1976
	B 476,681	E	Jan. 13, 1976
	B 499,718	E	Jan. 27, 1976
198	B 546,665	E	Jan. 20, 1976
347AD	B 507,647	E	Jan. 27, 1976
	B 526,106	E	Jan. 27, 1976
347CC	B 498,500	E	Jan. 20, 1976
Class 343			
7A	B 248,240	E	Jan. 13, 1976
7.7	B 484,029	E	Feb. 10, 1976
100LE	B 488,395	E	Jan. 27, 1976
100LE	B 496,502	E	Jan. 20, 1976
786	B 547,994	E	Jan. 20, 1976
815	B 563,244	E	Jan. 27, 1976
Class 346			
75	B 512,964	E	Feb. 10, 1976
Class 350			
96WG	B 381,985	M	Feb. 3, 1976
	B 537,722	M	Feb. 3, 1976
103	B 586,663	M	Feb. 3, 1976
160LC	B 527,054	M	Feb. 17, 1976
173	B 469,947	M	Jan. 20, 1976
310	B 520,543	M	Jan. 27, 1976
320	B 548,440	M	Feb. 3, 1976
Class 354			
46	B 515,135	E	Feb. 17, 1976
70	B 533,580	E	Feb. 3, 1976
298	B 489,328	E	Jan. 20, 1976
Class 355			
8	B 509,474	M	Feb. 17, 1976
17	B 493,501	M	Feb. 3, 1976
Class 356			
201	B 450,521	M	Feb. 17, 1976
Class 357			
16	B 496,487	E	Jan. 20, 1976
23	B 516,060	E	Feb. 17, 1976
36	B 508,961	E	Feb. 3, 1976
65	B 470,798	E	Jan. 20, 1976
Class 358			
8	B 554,939	E	Feb. 10, 1976
41	B 502,289	E	Jan. 13, 1976
Class 360			
1	B 484,365	E	Jan. 27, 1976
15	B 283,941	E	Feb. 3, 1976
17	B 461,874	E	Jan. 27, 1976
27	B 427,883	E	Jan. 20, 1976
60	B 491,111	E	Feb. 17, 1976
80	B 403,477	E	Feb. 3, 1976
81	B 500,176	E	Feb. 3, 1976
85	B 501,253	E	Feb. 3, 1976
130	B 579,806	E	Feb. 3, 1976
Class 401			
219	B 557,621	M	Feb. 3, 1976
Class 403			
107	B 513,789	M	Feb. 3, 1976
318	B 540,632	M	Jan. 13, 1976
Class 404			
71	B 452,672	M	Jan. 13, 1976
77	B 434,206	M	Feb. 3, 1976
Class 408			
124	B 501,993	M	Jan. 13, 1976
146	B 521,986	M	Feb. 3, 1976
Class 415			
14	B 471,735	M	Feb. 3, 1976
115	B 561,712	C	Feb. 17, 1976
213R	B 512,547	M	Jan. 13, 1976
214	B 552,006	M	Feb. 3, 1976
Class 416			
61	B 549,394	M	Jan. 27, 1976
Class 423			
238	B 485,401	C	Jan. 27, 1976
249	B 402,553	C	Feb. 17, 1976
283	B 521,984	C	Feb. 17, 1976
315	B 471,221	C	Jan. 13, 1976
390	B 549,198	C	Jan. 13, 1976
393	B 491,455	C	Feb. 3, 1976
448	B 414,028	C	Feb. 17, 1976
580	B 379,177	C	Jan. 27, 1976
Class 424			
9	B 426,424	C	Feb. 3, 1976
115	B 482,660	C	Feb. 10, 1976
122	B 524,179	C	Jan. 13, 1976
177	B 490,995	C	Feb. 3, 1976
203	B 576,903	C	Feb. 3, 1976
230	B 487,133	C	Jan. 27, 1976
257	B 374,588	C	Jan. 27, 1976
258	B 426,639	C	Feb. 3, 1976
263	B 466,929	C	Jan. 27, 1976
267	B 307,698	C	Feb. 3, 1976
	B 407,737	C	Feb. 3, 1976
270	B 521,711	C	Feb. 10, 1976
273	B 566,464	C	Feb. 3, 1976
274	B 496,431	C	Jan. 13, 1976
281	B 587,786	C	Feb. 17, 1976
311	B 457,862	C	Jan. 27, 1976
317	B 510,850	C	Feb. 3, 1976
362	B 495,489	C	Feb. 3, 1976
Class 425			
222	B 163,463	M	Jan. 27, 1976
384	B 562,813	C	Feb. 3, 1976
Class 426			
3	B 583,712	C	Feb. 10, 1976
276	B 535,944	C	Jan. 13, 1976
535	B 560,717	C	Feb. 10, 1976
548	B 439,778	C	Feb. 3, 1976
Class 427			
39	B 476,837	C	Jan. 20, 1976
70	B 381,709	C	Jan. 13, 1976
145	B 457,547	C	Feb. 17, 1976
186	B 537,085	C	Feb. 17, 1976
207	B 501,415	C	Jan. 13, 1976
343	B 160,099	C	Jan. 13, 1976
372	B 409,848	C	Jan. 27, 1976
389	B 519,377	C	Jan. 27, 1976
Class 428			
73	B 481,737	C	Jan. 13, 1976
289	B 402,929	C	Feb. 3, 1976
315	B 373,354	C	Jan. 27, 1976
341	B 450,196	C	Feb. 10, 1976
434	B 457,886	C	Jan. 13, 1976
Class 431			
175	B 534,313	M	Jan. 27, 1976
264	B 398,220	M	Feb. 3, 1976

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF FEBRUARY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. O. Smith Corporation: *See*—
Phlaum, Edward G., 3,938,946.

Aalpoel, Marten Geert, to Arenco P.M.B. B.V. Device for delivering objects of non-uniform thickness. 3,938,702, Cl. 221-238.000.

AB Metalform: *See*—
Falk, Curt Gunnar; Strandell, Per-Olof; and Sundberg, Karl Lennart, 3,938,362.

AB Stridsberg & Blorck: *See*—
Nedsten, Hans Ludvig, 3,938,417.

Abbott Laboratories: *See*—
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 3,939,043.
Ratajczyk, James Daniel; Stein, Robert George; and Swett, Leo Ralph, 3,939,161.
Scislowicz, Henry; and Frazier, Thomas A., 3,938,520.

Abe, Eisuke; and Tanaka, Kiyonobu, to Kabushikikaisha Yokogawa Denki Seisakusho. Self-balancing instrument. 3,939,388, Cl. 318-321.000.

Abella, Richard M.; Dodson, Keith D.; and Richardson, Jerry G., to Celanese Corporation. Thermoplastic melt apparatus. 3,938,924, Cl. 425-147.000.

Abu-El-Haj, Marwan J.; and McFarland, James W., to Pfizer Inc. Certain 3-oxo-2-aryl-5,6-dihydro-4(H)-pyrrolo-(1,2-C)(1,2,3)triazolium compounds. 3,939,174, Cl. 260-308.00A.

Acousa Saxon S.A.: *See*—
Haussels, Berthold, 3,938,864.

Adam, Fritz Guenter; and Schat, Hermannus, to ITT Industries, Inc. Delay line for analogous signals. 3,939,364, Cl. 307-221.00C.

Adam, Fritz Guenter, to ITT Industries, Inc. All-pass reverberator with an MOS delay line. 3,939,437, Cl. 330-84.000.

Adams, James E.: *See*—
Haas, Werner E. L.; and Adams, James E., 3,938,880.

Adams Laboratories, Inc.: *See*—
Garrett, Charles B., Sr.; Garrett, Roger L.; and Rubin, Alan B., 3,939,285.

Aerojet-General Corporation: *See*—
Katzakian, Arthur, Jr.; and DePree, David O., 3,939,071.

Agee, John Harvey: *See*—
Moore, William Percy; and Agee, John Harvey, 3,939,255.

Agency of Industrial Science & Technology: *See*—
Ato, Yasuro; and Miyagawa, Soji, 3,939,366.
Yamaga, Joji; and Jido, Morio, 3,938,345.

AGFA-Gevaert, AG: *See*—
Winkler, Alfred; Engelsmann, Dieter; Maas, Dieter; and Schroder, Rolf, 3,939,484.

Ahs, Inge Wilgot, to Aktiebolaget Lennartsfors Mekaniska Verkstad. Cushion member for sound-proof sealing. 3,938,614, Cl. 181-129.000.

Aidala, Dwain; and Welz, Albert W., Jr., to Arthur D. Little, Inc. Electronic timer switch. 3,939,361, Cl. 307-141.000.

All Systems, Inc.: *See*—
Zook, James K., 3,938,258.

Air Preheater Company, Inc., The: *See*—
McClure, Kenneth R., 3,938,971.

Aisin Seiki Kabushiki Kaisha: *See*—
Ohmi, Atsushi, 3,938,424.

Akamatsu, Hideaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with a plurality of exhaust valves. 3,938,482, Cl. 123-75.00C.

Akin, Cavit; Flannery, Robert J.; and Darrington, Franklin D., to Standard Oil Company. Process for the production of meat, poultry and fish analogs and the products thereof. 3,939,284, Cl. 426-250.000.

Akizawa, Nobuo. Apparatus for washing cereals. 3,938,534, Cl. 134-104.000.

Aktiebolaget Lennartsfors Mekaniska Verkstad: *See*—
Ahs, Inge Wilgot, 3,938,614.

Akzona Incorporated: *See*—
McNeill, William Allen, 3,938,952.
Rice, Charles M., 3,938,311.

Aladiev, Ivan Timofeevich; Voskresensky, Kirill Dmitrievich; Gukov, Gennady Petrovich; Saperov, Evgeny Valentinovich; and Fardzinov, Valery Kombolatovich. Rock-exploitation method based on thermodynamic cycles utilizing in-situ energy source. 3,938,592, Cl. 166-299.000.

Alarie, Allan P.: *See*—
Helton, Robert A.; Walsh, George M.; and Alarie, Allan P., 3,939,465.

Albaric, Jacques E.; Burkhart, Charles W.; and Jones, Warren W., to Westinghouse Electric Corporation. Liquid-cooled rotor for dynamoelectric machines. 3,939,368, Cl. 310-59.000.

Albrecht, Hans Peter; and Neugebauer, Gunter, to Knoll A.G. Chemische Fabriken. Cardenolides. 3,939,156, Cl. 260-239.570.

Alexander, Ernest John; and Mooradian, Aram, to Sterling Drug Inc. 4-Aminomethyl-9-benzyl-1,2,3,4-tetrahydrocarbazoles. 3,939,177, Cl. 260-315.000.

Alfred, P. Allan; Rothstein, Sven-Olie H.; and Popoff, Stig Vilhelm, to Frigoscandia Contracting AB. Self-supporting spiral conveyor. 3,938,651, Cl. 198-136.000.

Alig, Leo; Furst, Andor; and Muller, Marcel, to Hoffmann-La Roche Inc. D-Homosteroids. 3,939,193, Cl. 260-457.000.

Allan, Frank V.; Fenn, John B., Jr.; and Welkowsky, Murray S., to Xonics, Inc. Liquid crystal imaging of radiograms. 3,939,345, Cl. 250-315.00A.

Allegheny Ludlum Industries, Inc.: *See*—
Hartline, Albert G., III, 3,938,990.

Allen, Clifford Harry. Positive displacement rotary pump and drive coupling therefor. 3,938,744, Cl. 241-46.110.

Allen, Dee Dexter, to U. S. Industries, Inc. Feed cleaner. 3,939,064, Cl. 209-44.000.

Allied Chemical Corporation: *See*—
Barrett, Joseph J., 3,939,348.
Kavesh, Sheldon, 3,938,583.
Lees, Robert, 3,938,925.
Moore, William Percy; and Agee, John Harvey, 3,939,255.
Stephenson, Robert L.; and Loomba, Yogendra Singh, 3,938,754.
Stephenson, Robert L.; Pfeiffer, Robert C.; and Loomba, Yogendra Singh, 3,938,755.

Allis-Chalmers Corporation: *See*—
Konyha, Peter P., 3,938,400.

Allison, Lawrence McFarland, to Apor Industries, Inc. Shower heads. 3,938,741, Cl. 239-75.000.

Allmanna Svenska Elektriska Aktiebolaget: *See*—
Claesson, Harry; and Traff, Anders, 3,938,361.

Alm, Gerald F., to Wickes Corporation, The. Liquid level monitoring device. 3,939,383, Cl. 317-123.000.

Alphen, Jacques M. Lighting system for a motorcycle. 3,939,339, Cl. 240-62.200.

Alps Electric Co., Ltd.: *See*—
Kasahima, Masao, 3,939,451.

Alps Motorola Inc.: *See*—
Takeda, Tekeshi, 3,939,492.

Altscher, Siegfried; and Goswami, Jagadish C., to Stauffer Chemical Company. Bis(hydroxy and halo alkyl) alkyl or aryl phosphonates. 3,939,227, Cl. 260-953.000.

Aluminum Company of America: *See*—
Hawkins, Ronald G., 3,939,300.
Kelsey, Ronald A., 3,938,363.
Urmston, Hugh C., 3,938,455.

Alza Corporation: *See*—
Leeper, Harold M.; and Michaels, Alan S., 3,938,515.

Amari, Shinji; and Masuda, Takashi, to Sony Corporation. Magnetic recording and/or reproducing system. 3,939,485, Cl. 358-4.000.

Amaroso, James R.: *See*—
Coppock, Walter J.; Amaroso, James R.; and Griffith, John Q., III, 3,939,083.

Ambruoso, Pasquale, Sr., to Motorola, Inc. Speaker grille screen and mounting structure. 3,938,618, Cl. 181-155.000.

Amchem Products, Inc.: *See*—
Reed, Stuart, 3,939,014.

American Can Company: *See*—
Colberg, Kenneth Herman; and Zukowski, Ronald Joseph, 3,939,110.

American Cyanamid Company: *See*—
Behrens, Rudolf Adolf, 3,939,128.
Calbo, Leonard Joseph, Jr., 3,939,121.
Nau, Harold Henry, 3,938,469.
Preston, Peter Joseph, 3,938,832.
Spector, Richard Harvey; and Madison, Richard Keith, 3,939,211.
Wagner, Frank Albert, Jr., 3,939,263.

American Gas Association: *See*—
Pangborn, Jon B.; and Sharer, John C., 3,939,257.

American Hoechst Corporation: *See*—
Dornauer, Horst; and Anderson, Vernon Brian, 3,939,159.

American Home Products Corporation: *See*—
Demerson, Christopher A.; Humber, Leslie G.; Dobson, Thomas A.; and Jirkovsky, Ivo L., 3,939,178.

American Hospital Supply Corporation: *See*—
McPhee, Charles J., 3,938,519.
Ryan, Jay Edward, 3,938,688.

American Locker Company, Inc.: *See*—
Stackhouse, Wells F.; and Barth, Douglas A., 3,938,640.

American Safety Equipment Corporation: *See*—
Henderson, Cyril; and Broughton, John N., 3,938,859.

AMP Incorporated: *See*—
Hollyday, Robert David; Bradbery, Jack Leo; and Hudson, William Jeffrey, Jr., 3,939,444.
Over, William Roderick; and Gress, Paul William, 3,938,246.

Andco Incorporated: *See*—
Lucas, Theodore W., Jr., 3,938,451.

Anderson, Carl C.; and Marchetti, Joseph R., to PPG Industries, Inc. Process for electrodeposition of cationic thermosetting compositions. 3,939,051, Cl. 204-181.000.
Anderson, Carsten D. Teat cautery bullet. 3,938,517, Cl. 128-271.000.
Anderson, James D. Boat trailer latching device. 3,938,829, Cl. 280-414.00R.
Anderson, James K. Apparatus for improving printing surface of printing material. 3,938,261, Cl. 34-114.000.
Anderson, Leroy E., to Manufacturers Systems, Inc. Flexible cylindrical metal tube. 3,938,558, Cl. 138-122.000.
Anderson, Matthew E.; Redmond, Stephen L.; Horky, John W.; and Krolak, Leo V., to United States of America, Navy. Pressure-armed explosive apparatus. 3,938,438, Cl. 102-7.200.
Anderson, Michael L.; Folwer, Harold W.; and McKie, David A., to Caterpillar Tractor Co. Apparatus for skiving and cleaning reinforced hose. 3,938,215, Cl. 15-304.000.
Anderson, Vernon Brian: *See—*
Dornauer, Horst; and Anderson, Vernon Brian, 3,939,159.
Anderson, Weston A.; and Waller, Bruce E. Electrical acupuncture needle heater. 3,938,526, Cl. 128-303.100.
Andersson, Karl Gosta Bertil, to Duni Bila AB. Disposable cardboard plates. 3,938,727, Cl. 229-2.50R.
Andoh, Shizuo; and Murase, Kenji, to Fujitsu Limited. Gas discharge panel information read-out system. 3,939,454, Cl. 340-173.0PL.
Andrassy, Stella. Apparatus for solar cooking. 3,938,497, Cl. 126-270.000.
Andreas Stihl Maschinenfabrik: *See—*
Dietzsch, Gunter; Frers, Gerd; and Wieland, Dieter, 3,938,633.
Andrew Corporation: *See—*
Merle, Michel, 3,938,244.
Andrews, Alvadore M., deceased (Oregon, The United States National Bank of, executor). Multiple mold rotary casting apparatus. 3,938,928, Cl. 425-430.000.
Andrusiak, Peter W. M. Folding display easel. 3,938,772, Cl. 248-461.000.
Anno, James N.: *See—*
Fawcett, Sherwood L.; and Anno, James N., 3,938,337.
Antos, George J., to Universal Oil Products Company. Hydrocarbon conversion with an acidic sulfur-free multimetallic catalytic composite. 3,939,059, Cl. 208-139.000.
Aoki, Hachiro, to Diesel Kiki Co., Ltd. Diesel engine fuel injection pump governor. 3,938,488, Cl. 123-140.00R.
Apor Industries, Inc.: *See—*
Allison, Lawrence McFarland, 3,938,741.
Apple, Charles N., Sr., to Metafab Industries, Inc. Tube joining system. 3,938,900, Cl. 403-263.000.
Appleman, William S.: *See—*
Richmond, Albert R.; and Appleman, William S., 3,938,597.
Applied Bioscience: *See—*
Wertlake, Paul Terence; and Harrison, James Steele, 3,938,366.
Aquappliances, Inc.: *See—*
Kampf, William M.; and Law, Denny B., 3,938,496.
Arai, Hiroshi; Ohta, Jun; Taniguchi, Koichi; Sakurai, Yasuhiko; and Ohtake, Toshikazu, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Liquid level detecting and indicating system for vehicle. 3,939,470, Cl. 340-59.000.
Archuleta, William A. Evaporative cooler cover. 3,938,694, Cl. 220-77.000.
Arctic Pac, Inc.: *See—*
Schmit, Justin M., 3,938,707.
Arenco P.M.B. B.V.: *See—*
Aalpoel, Marten Geert, 3,938,702.
Arendt, Hans F. Web finishing machines. 3,938,356, Cl. 68-5.00D.
Armco Steel Corporation: *See—*
Burger, John H.; McClelland, John R.; and Dunkle, Robert P., 3,939,296.
Armor Elevator Company, Inc.: *See—*
Maynard, John T., 3,938,624.
Armour and Company: *See—*
Sato, Kunito; and Hegarty, Gerald R., 3,939,288.
Armstrong, Albert Warner. Fluid lasting of shoes and similar operations. 3,938,211, Cl. 12-145.000.
Arthur D. Little, Inc.: *See—*
Aidala, Dwain; and Welz, Albert W., Jr., 3,939,361.
Arvidson, Harold C., Jr.; and Stottlemyer, Quayton Ray, to Du Pont de Nemours, E. I., and Company. Flat photographic film produced by heating above the second order transition temperature of the base. 3,939,000, Cl. 96-87.00R.
Asahi Denka Kogyo Kabushiki Kaisha: *See—*
Terada, Kimio; Fujita, Satoshi; Oinuma, Shigeru; and Kohno, Hiroshige, 3,939,290.
Asahi Dow, Ltd.: *See—*
Naito, Hirokuni; Yoshimura, Isao; and Tashiro, Hisao, 3,939,237.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Takahashi, Yasuo, 3,938,883.
Asahi Kogyo Kabushiki Kaisha: *See—*
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Asai, Shin-Ichiro: *See—*
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Asami, Kazuto: *See—*
Ushio, Masatoshi; Asami, Kazuto; and Hirokuni, Matono, 3,938,303.
Asano, Setunobu; and Nakamura, Tadasi, to Mitsubishi Gas Chemical Co. Inc. Process for methanol synthesis. 3,939,191, Cl. 260-449.500.
Asayama, Kingo, to Kabushiki Kaisha Takechi Koumusho. Earth auger and method for driving piles and the like by means of said earth auger. 3,938,344, Cl. 61-53.660.
Astra Lakemedel Aktiebolag: *See—*
Ekstrom, Bertil Ake; and Sjoberg, Berndt Olof Harald, 3,939,270.
Astra Pharmaceutical Products Inc.: *See—*
Tischlinger, Edward A., 3,938,518.
Ateliers des Charmilles, S.A.: *See—*
Bonga, Benno Ibo, 3,939,322.
Atkins, George; and Evans, Philip J., to Dunlop Limited. Moulds. 3,938,921, Cl. 425-111.000.
Atlas Copco Aktiebolag: *See—*
Bertilsson, Alf Georg; and Svensson, Sten Gunnar Hugo, 3,938,739.
Bertilsson, Alf Georg; Svensson, Sten Gunnar Hugo; and Soderman, Claes Erik, 3,938,740.
Olofsson, Hans Kristoffer, 3,938,915.
Ato, Yasuro; and Miyagawa, Soji, to Agency of Industrial Science & Technology. Method of converting radioactive energy to electric energy and device for performing the same. 3,939,366, Cl. 310-3.00R.
Atom Auto Pecas Ltd.: *See—*
Simon, Arpad, 3,939,230.
Aubert, Jean. Method and a device for building immersed foundations. 3,938,342, Cl. 61-46.000.
Audi NSU Auto Union Aktiengesellschaft: *See—*
van Basshuysen, Richard, 3,938,329.
Aumuller, Walter; Weyer, Rudi; and Heerdt, Ruth, to Hoechst Aktiengesellschaft. Benzenesulfon YL-semicarbazides for lowering blood sugar levels. 3,939,269, Cl. 424-258.000.
Austral-Erwin Engineering Co.: *See—*
Erwin, Ransome W., 3,939,036.
Automated Packaging Systems, Inc.: *See—*
Lerner, Bernard, 3,938,299.
Automobiles Peugeot: *See—*
Boudeville, Jean-Claude; and Gelin, Jacques, 3,938,612.
Roubinet, Pierre, 3,938,288.
Automotive Products Co., Ltd.: *See—*
Davies, David Aubrey; and Johnson, Dennis Sydney, 3,938,635.
Avery Products Corporation: *See—*
McDavid, James E., Jr.; Truesdell, Stanley E.; and Chipps, Elmer Thomas, 3,938,698.
Awazuhara, Hiroshi: *See—*
Shida, Shigeru; Yasuda, Kenichi; Awazuhara, Hiroshi; and Tsumura, Sukebumi, 3,938,360.
Aylard, William F.; and Blank, Albert I., to Chase Brass & Copper Co., Incorporated. Stoker feed system. 3,939,297, Cl. 13-29.000.
B. F. Goodrich Company, The: *See—*
Hallenbeck, Victor L., 3,938,573.
Schollenberger, Charles S.; and Dinbergs, Kornelius, 3,939,111.
Baba, Ken-ichi: *See—*
Nishibayashi, Yoshifumi; Shimizu, Atsushi; Shiga, Yasuhiro; Okabe, Kenji; and Baba, Ken-ichi, 3,939,021.
Babcock, Don L. Barrel handler. 3,938,768, Cl. 248-129.000.
Babkin, Artur Grigorievich: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Koleshikova, Nina Ivanovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,938,951.
Babunovic, Momir, to Barry-Wehmiller Company. Container cleaning apparatus. 3,938,532, Cl. 134-43.000.
Bacskai, Robert, to Chevron Research Company. Esters. 3,939,201, Cl. 260-488.00J.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Koenig, Horst; Metzger, Horst; and Reif, Werner, 3,939,184.
Sliwka, Wolfgang; Gaefke, Wolf-Ruediger; and Korth, Tilmann, 3,939,095.
Bagwell, James H., to Doonan Trailer Corporation. Door construction for hopper trailer. 3,938,861, Cl. 298-27.000.
Baile, Clifton A.; McLaughlin, Carol Lynn; and Webb, Robert Lee, to SmithKline Corporation. Methods and compositions for increasing growth rate and feed efficiency of animals. 3,939,275, Cl. 424-310.000.
Bailey, Leo L.; and Kimmel, David R. Gas generator. 3,938,327, Cl. 60-39.770.
Bajer, Francis J., to Hooker Chemicals & Plastics Corporation. Selective oxyalkylation of mercaptophenols. 3,939,210, Cl. 260-609.00F.
Balogh, John J., Jr.: *See—*
Carnes, W. Robert; Balogh, John J., Jr.; and Selnick, Lester L., 3,938,663.
Ban, Thomas E., to McDowell-Wellman Engineering Company. Process for preparing a smelter furnace charge composition. 3,938,987, Cl. 75-3.000.
Bangay, Albert: *See—*
Jackson, John A., 3,939,360.
Barber, Lois M. Hand splint. 3,938,509, Cl. 128-77.000.
Bard, Donald I. Fancy stitchery working frame support. 3,938,267, Cl. 38-102.100.

Baremor, Jerry F., to Eaton Corporation. Differential drive mechanism. 3,938,408, Cl. 74-711.000.

Barie, Walter P., Jr.; Onopchenko, Anatoli; and Schulz, Johann G. D., to Gulf Research & Development Company. Polyamic-acids prepared from 3,3,4,4-benzhydrol tetracarboxylic dianhydride. 3,939,109, Cl. 260-29.10R.

Barlow, G. Benjamin; and Wolfe, Chester G., to International Harvester Company. Swingable rotary screen. 3,938,586, Cl. 165-51.000.

Barnard, John David William; and Kurer, Peter Frank, to Kurer Research & Development. Dental instrument holder. 3,938,253, Cl. 32-40.00R.

Barnes, Porter I.; and Steele, Carlton A., to Leesona Corporation. Strand delay device. 3,938,750, Cl. 242-36.000.

Barnes, Stanley Charles; and Lawrie, Robert James, to Joseph Lucas (Batteries) Limited. Method of making battery plate grids for lead-acid batteries and alloys therefor. 3,939,009, Cl. 136-66.000.

Barrett, Joseph J., to Allied Chemical Corporation. Infrared gas analysis. 3,939,348, Cl. 250-339.000.

Barringer, Jerry M.; Harris, Raymond W.; and Woodward, John B., to General Electric Company. Circuit for indicating the battery voltage and operation of a radio transmitter. 3,939,421, Cl. 325-133.000.

Barry-Wehmiller Company: *See*—
Babunovic, Momir, 3,938,532.

Bartels, Klaus Peter: *See*—
Detzel, Josef; and Bartels, Klaus Peter, 3,938,730.

Barth, Douglas A.: *See*—
Stackhouse, Wells F.; and Barth, Douglas A., 3,938,640.

Barth, Jordan B., to Colgate-Palmolive Company. Flavored dentifrice. 3,939,261, Cl. 424-49.000.

Bartholomew, Allan E., to Myers Industries, Inc. Cassette storage device with adjustable partitions. 3,938,871, Cl. 312-240.000.

BASF Aktiengesellschaft: *See*—
Elser, Wolfgang; and Ruske, Manfred, 3,939,162.
Fischer, Adolf, 3,938,984.
Nagel, Otto; Kuerten, Heribert; and Zehner, Peter, 3,938,738.

Bastide, Paul. Special aircraft using a novel integrated lift, propulsion and steering system. 3,938,759, Cl. 244-9.000.

Batchelor, John Frederick: *See*—
Hodson, Harold Francis; and Batchelor, John Frederick, 3,939,173.
Hodson, Harold Francis; and Batchelor, John Frederick, 3,939,276.

Bats, Jules. Apparatus for deodorizing liquids. 3,939,073, Cl. 210-152.000.

Battelle Development Corporation: *See*—
Fawcett, Sherwood L.; and Anno, James N., 3,938,337.

Bauer Bros. Co., The: *See*—
Ginaven, Marvin E., 3,939,075.

Bauer, Frederick T., to Robertshaw Controls Company. Primary control and ignition system for oil burners. 3,938,940, Cl. 431-79.000.

Bauer, Hans. Apparatus for grilling with heat storing arrangement. 3,938,493, Cl. 126-41.00R.

Bauer, Hans, to Bauer, Hans; and Fa. Dietz-Druckguss KG. Grilling apparatus with supporting surface. 3,938,495, Cl. 126-41.00R.

Bauer, James J., to Clark Equipment Company. Two-speed motor control for dual hydrostatic transmissions. 3,938,401, Cl. 74-471.00R.

Bauer, William J. Sewage treatment process. 3,939,066, Cl. 210-6.000.

Baum, Charles S.: *See*—
Feilbach, Weston H., Jr.; and Baum, Charles S., 3,938,962.

Bayer Aktiengesellschaft: *See*—
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Beauplat, Philippe L. Punching or nibbling presses having a turret. 3,938,416, Cl. 83-552.000.

Beckman Instruments, Inc.: *See*—
Van Lenten, Constance; Rosenthal, Robert; and Sperry, Elmer A., III, 3,939,401.
Wright, Herschel E.; and Ishimaru, Kenzo, 3,938,735.

Beecham Group Limited: *See*—
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Ferres, Harry; and Clayton, John Peter, 3,939,180.
Nayler, John Herbert Charles; Pearson, Michael John; and Southgate, Robert, 3,939,157.

Begrich, Rainer, to Ciba-Geigy AG. N-(2,4-dihalo-S-triazin-6-yl)-ureas and process for their manufacture. 3,939,158, Cl. 260-249.500.

Behrens, Rudolf Adolf, to American Cyanamid Company. Vulcanization of halogen or epoxy-containing polyacrylate elastomers. 3,939,128, Cl. 260-79.50P.

Behrenz, Wolfgang: *See*—
Kuhle, Engelbert; Siegle, Peter; Hammann, Ingeborg; and Behrenz, Wolfgang, 3,939,192.

Beil, Richard C., to Caterpillar Tractor Co. Volume signal generator for thermodynamic cycle analyzers. 3,938,376, Cl. 73-115.000.

Bekoto: *See*—
Jauneaud, Francois, 3,938,472.

Bell, Malcolm Charles Evert; and Sridhar, Ramamritham, to International Nickel Company, Inc., The. Arsenic removal from nickel matte. 3,938,989, Cl. 75-82.000.

Bell, Thomas Robert; and Smith, Perrin Gary, to Pennwalt Corporation. Continuous production of thiophene from butane. 3,939,179, Cl. 260-332.800.

Bell, William F.; and Van Deberg, Walter H., to F. Jos. Lamb Company. Workpiece elevator. 3,938,649, Cl. 198-38.000.

Bellingham, Andrew Irwin, to Warman Equipment (International) Limited. Process for the separation of tungsten and molybdenum. 3,939,245, Cl. 423-55.000.

Belliot, Christian; Cheylan, Etienne; Madelaine, Serge; and Ebbing, Johannes, to Compagnie Francaise Thomson Houston-Hotchkiss Brandt. Catalytic product for the oxidative destruction of gaseous organic compounds and method for their preparation. 3,939,103, Cl. 252-455.00R.

Beloit Corporation: *See*—
Hill, Lester M., 3,939,037.

Belokoskov, Valentin Ivanovich: *See*—
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Koleshikova, Nina Ivanovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,938,951.

Bencini, Ferdinando: *See*—
Console, Luciano; Bencini, Ferdinando; and Chiellini, Enzo, 3,939,120.

Bendix Corporation, The: *See*—
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Roberts, James K., 3,939,373.

Benecke, Gunther: *See*—
Traub, Karl; and Benecke, Gunther, 3,939,426.

Benjamin, Braham G., to Flo-Tite Plastics Corporation. Plastic valve. 3,938,779, Cl. 251-268.000.

Benkoe, Erwin: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,938,277.

Bennett, Max E.; McCanse, James Edson; Lawson, Gordon L.; and Clark, William H., to Hesston Corporation. Grappling hayfork. 3,938,681, Cl. 214-147.00G.

Bennett, Robert A., to Procter & Gamble Company, The. Safety device for aerosol can. 3,938,710, Cl. 222-153.000.

Benzan, Luciano. Process for improving the combustion of solid. 3,938,932, Cl. 431-2.000.

Beretta, Paolo: *See*—
Gandino, Mario; and Beretta, Paolo, 3,939,176.

Berg, Richard D.; Brown, Donald R.; Masopust, Otto T., Jr.; and Stoltz, James F., to Western Electric Company, Inc. Wound resistor-capacitor network and method of forming. 3,939,440, Cl. 333-70.0CR.

Bergt, Wolfgang, to Motoren- und Turbinen-Union Munchen GmbH. Aerodynamic flame holder. 3,938,325, Cl. 60-39.72R.

Bermishev, Andrei Vasilievich: *See*—
Ovchinnikov, Viktor Sergeevich; Grigorov, Eduard Ivanovich; Magdesian, Arkady Lukyanovich; Gorelikov, Vladimir Ivanovich; Bermishev, Andrei Vasilievich; Utkin, Alexandr Stepanovich; Fedotov, Viktor Konstantinovich; and Volkov, Vladimir Yakovlevich, 3,938,346.

Bernaerts, Henry J. Valve with heat transport monitor for leakage determining rate. 3,938,544, Cl. 137-334.000.

Bernold, Jean. Apparatus for wet spraying of concrete. 3,938,786, Cl. 259-151.000.

Bershtein, Ruvim Semenovich: *See*—
Bobylev, Vitaly Petrovich; Kravtsov, Alexandr Feodosievich; Bytkin, Vitaly Nikolaevich; and Bershtein, Ruvim Semenovich, 3,938,787.

Bertele, Erhard; and Schudel, Peter, to Givaudan Corporation. Process for preparation of terpene flavorants and novel intermediates therefor. 3,939,206, Cl. 260-601.00R.

Bertilsson, Alf Georg; and Svensson, Sten Gunnar Hugo, to Atlas Copco Aktiebolag. Nozzle for electrostatic spray gun. 3,938,739, Cl. 239-15.000.

Bertilsson, Alf Georg; Svensson, Sten Gunnar Hugo; and Soderman, Claes Erik, to Atlas Copco Aktiebolag. Nozzle for electrostatic spray gun. 3,938,740, Cl. 239-15.000.

Bertolasi, Robert B., to Kelsey-Hayes Company. Intake manifold valve throttle control for spin control system. 3,938,611, Cl. 180-77.00R.

Bertrand, Isidore L. Q.; and Hays, Wilford R., to Lockheed Aircraft Corporation. Portable electrical discharge metalworking machine. 3,939,321, Cl. 219-69.00D.

Bethlehem Steel Corporation: *See*—
McDowell, Wendell V., 3,939,324.

Beverini, Nicola: *See*—
Strumia, Franco; and Beverini, Nicola, 3,938,877.

Bezerie, Jean Pierre; and Sirieix, Michel Benoit, to Societe Anonyme de Telecommunications. Device for measuring an angular deviation by heterodyne detection. 3,939,342, Cl. 250-203.00R.

Bichel, Darwin Carl, to Deere & Company. Combine grain tank loading conveyor. 3,938,683, Cl. 214-519.000.

Bickford, William J., to Raytheon Company. Plural channel communications system. 3,939,407, Cl. 325-47.000.

Biegelsen, David K.; Starkweather, Gary K.; and Zesch, James C., to Xerox Corporation. Acousto-optic modulation device. 3,938,881, Cl. 350-161.000.

Bildstein, Hubert; Knotik, Karl; and Leichter, Peter, to HOBEG Hochtemperaturreaktor-Brennelement GmbH. Method for the production of spherical particles. 3,939,233, Cl. 264-13.000.

Billeter, Thomas R.; Philipp, Lee D.; and Schemmel, Richard R., to Westinghouse Electric Corporation. Microwave fluid flow meter. 3,939,406, Cl. 324-58.50C.

Billi, S.p.A.: *See—*
Conti, Paolo, 3,938,355.

Billington, Arthur Ernest, to Beecham Group Limited. Colored foodstuffs and beverages. 3,939,283, Cl. 426-250.000.

Bingham, Rowland Hardy, to National Research Development Corporation. Electromechanical transducer. 3,938,379, Cl. 73-141.00A.

Birkle, Adolph John: *See—*
Gardner, Larry E.; Grenawalt, John J.; and Birkle, Adolph John, 3,939,013.

Birnbaum, Michael R.; and Cosentino, Louis C., to Medtronic, Inc. Blood pressure monitoring system. 3,938,506, Cl. 128-2.05A.

Biro, Oszkar; Danyi, Edit; Fenyvesi, Magdolna; and Pamuk, Janos, to Finommechanikai Vallalat. Frequency-selective coupling for high-frequency electromagnetic waves. 3,939,443, Cl. 333-73.00R.

Birrell, Peter Leslie, to Cornelius Company, The. Portable dispenser for mixed beverages. 3,938,639, Cl. 194-87.000.

Bishop, Larry D., to General Electric Company. Arrangement for utilizing all pulses in a narrow band channel of a time-division multiplex, pulse code modulation system. 3,939,307, Cl. 179-15.00A.

Bitsch, Rainer; and Diessner, Armin, to Siemens Aktiengesellschaft. Arrangement for testing metal-clad, high-voltage installations. 3,939,410, Cl. 324-72.000.

Bjorkman, Claes: *See—*
Strouth, Lennart; and Bjorkman, Claes, 3,938,539.

Blair, Richard F., to Tylan Corporation. Mass flow meter with reduced attitude sensitivity. 3,938,384, Cl. 73-204.000.

Blank, Albert I.: *See—*
Aylard, William F.; and Blank, Albert I., 3,939,297.

Blickle, Tibor: *See—*
Ormos, Zoltan; Csukas, Bela; Stefko, Bela; Pataki, Karoly; Blickle, Tibor; and Felmeri, Jozsef, 3,938,259.

Bloch, Herman S., to Universal Oil Products Company. Process for the preparation of alkaline sulfate esters of N-alkyl-substituted hydroxypolyalkoxymethylcyclohexenes. 3,939,197, Cl. 260-458.000.

Bloch, Peter: *See—*
Isenberg, Gerhard; Bloch, Peter; and Tuzinsky, Wolfgang, 3,938,913.

Bloom, Joseph Louis; and Bottoms, Harry Simister, to Joseph Lucas (Industries) Limited. Torque-transmitting devices. 3,938,398, Cl. 74-63.000.

Blum Gesellschaft m.b.H.: *See—*
Rock, Erich; and Mages, Bernhard, 3,938,219.

Board of Trustees of the Leland Stanford Junior University: *See—*
Kronick, Melvyn N.; and Little, William A., 3,939,350.

Bobbitt, William C., Jr., to Hafner, Rudolph; and Hafner, John, part interest to each. Vehicle servicing system. 3,938,621, Cl. 184-1.500.

Bobylev, Vitaly Petrovich; Kravtsov, Alexandr Feodosievich; Bytkin, Vitaly Nikolaevich; and Bershtein, Ruvim Semenovich. Apparatus for mixing and granulating bulk materials. 3,938,787, Cl. 259-177.00R.

Bocca, Giorgio: *See—*
Giorgini, Gerardo; and Bocca, Giorgio, 3,938,826.

Bockmon, William E., Jr., to Gamut Games, Inc. Game apparatus including board and pieces. 3,938,808, Cl. 273-131.0BA.

Bodenger, Jacob. Stethoscope consisting of a stethoscope chest piece and a sound mixer. 3,938,615, Cl. 181-131.000.

Bodor, Nicolae S.; Sloan, Kenneth B.; and Hussain, Anwar A., to Interx Research Corporation. Novel, transient pro-drug forms of l-dopa useful in the treatment of parkinson's disease. 3,939,253, Cl. 424-309.000.

Boehringer Ingelheim GmbH: *See—*
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Boeing Company, The: *See—*
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Klees, Garry W., 3,938,328.
VanWyk, Jan W., 3,938,868.

Bogert, Clayton. Protective closures for containers. 3,938,715, Cl. 222-534.000.

Bohm, Leslie Eric: *See—*
Jackson, W. Shaun; and Bohm, Leslie Eric, 3,938,716.

Boileau, Jacques, to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie. Pneumatic tires. 3,938,575, Cl. 152-362.00R.

Bolha, John J., to Robertshaw Controls Company. Plural range pressure regulator construction and cap assembly therefor. 3,938,542, Cl. 137-271.000.

Bolton, Ivan Joseph; Fleck, Fritz; and Mercer, Alec Victor, to Sandoz Ltd., (Sandoz AG). Pyrazoline derivatives. 3,939,154, Cl. 260-239.900.

Bom, Nicolaas. Apparatus with a catheter for examining hollow organs or bodies with the ultrasonic waves. 3,938,502, Cl. 128-2.00V.

Bonga, Benno Ibo, to Ateliers des Charmilles, S.A. Electrode tool holder assembly for electrical machining apparatus. 3,939,322, Cl. 219-69.00R.

Borden, George W.: *See—*
Carder, Charles H.; and Borden, George W., 3,939,126.

Borg-Warner Corporation: *See—*
Hechenbleikner, Ingenuin; and Enlow, William Plamer, 3,939,229.
Oglesby, Cecil D., 3,938,486.
Roberts, Thomas J.; and Paulson, Donald L., 3,938,200.

Borum, Charles J., to Hobart Corporation. Trash compactor with clock timer control. 3,938,433, Cl. 100-51.000.

Borzym, Alexander. Tube cutoff apparatus. 3,938,415, Cl. 83-385.000.

Boser, Ronald J. Sewing machine cutting device. 3,938,454, Cl. 112-130.000.

Bossert, Freidrich: *See—*
Meyer, Horst; Bossert, Freidrich; Vater, Wulf; and Stoepel, Kurt, 3,939,171.

Boswell, George T. Vehicle safety apparatus. 3,938,825, Cl. 280-150.00B.

Bottoms, Harry Simister: *See—*
Bloom, Joseph Louis; and Bottoms, Harry Simister, 3,938,398.

Boucher, Lionel J. Bladder wash method and apparatus. 3,938,514, Cl. 128-232.000.

Boudeville, Jean-Claude; and Gelin, Jacques, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Anti-skid system for the driving wheels of automotive vehicles. 3,938,612, Cl. 180-82.00R.

Bourdon, Normand C., to Bendix Corporation, The. Electrical connector contact retention system. 3,938,874, Cl. 339-59.00M.

Bous, Karl. Spinning and winding of yarns. 3,938,306, Cl. 57-34.00R.

Bowmar Instrument Corporation: *See—*
Donaldson, James M., 3,938,403.

Boyar Schultz Corporation: *See—*
Mercer, Norman Joseph, Jr., 3,938,492.

Boyd, Edward L.; and McInerney, John P., to Westinghouse Electric Corporation. Insulated transformer windings. 3,939,449, Cl. 336-60.000.

Bradbery, Jack Leo: *See—*
Hollyday, Robert David; Bradbery, Jack Leo; and Hudson, William Jeffrey, Jr., 3,939,444.

Brakensiek, Lee Wesley. Sliding door lock. 3,938,838, Cl. 292-210.000.

Brandt, Bertil. Boat mooring apparatus. 3,938,462, Cl. 114-230.000.

Branson Ultrasonics Corporation: *See—*
Grgach, Frank J.; and Harris, Everett A., 3,939,033.

Brantingham, George L.; Phillips, Louis H.; and Novak, Larry T., to Texas Instruments Incorporated. Universal condition latch in an electronic digital calculator. 3,939,335, Cl. 235-156.000.

Brasa, Umberto. Method and apparatus for deviating objects transported along a conveyor. 3,938,646, Cl. 198-31.00R.

Bray, Donald T., to Desalination Systems, Inc. Apparatus for control of a reverse osmosis system. 3,939,074, Cl. 210-257.00M.

Bredeweg, Corwin J., to Dow Chemical Company, The. Chlorinated and brominated carbocyclic diethers. 3,939,212, Cl. 260-611.00R.

Brems, John Henry. Programmable multiple step indexing drive mechanism. 3,938,396, Cl. 74-55.000.

Brenner, Robert A.; and Cuthbert, Victor W., to Whirlpool Corporation. Adjustable baffle for appliance. 3,938,260, Cl. 34-108.000.

Bresnahan, Roger M.: *See—*
Curtis, Thomas W.; and Bresnahan, Roger M., 3,939,456.

Bridger, Andrew; and Dakss, Mark L., to GTE Laboratories Incorporated. Method for positioning an optical fiber. 3,938,895, Cl. 356-152.000.

Bright, William L. Safety lock for enclosures. 3,938,837, Cl. 292-149.000.

Brinkmann, Heinz; Gersbeck, Rolf; and Schlomach, Eckart, to Hermann Berstorff Maschinenbau GmbH. Apparatus for the continuous manufacture of chipboard panels, fibre panels or the like. 3,938,927, Cl. 425-373.000.

British Insulated Callender's Cables Limited: *See—*
Gosling, Cyril Henry; Glick, David; Powell, Alan Leslie; and Murray, William Young, 3,939,298.
Raw, Peter Michael; and Llewellyn, Rees Jenkin, 3,939,299.

British Petroleum Chemical International Ltd., The: *See—*
Pearce, David, 3,939,221.

British Railways Board: *See—*
Sudworth, James L.; and Tilley, Alec R., 3,939,007.

Britton, James E.: *See—*
Hein, Richard D.; Welch, John A.; and Britton, James E., 3,938,852.

Broadbent, Lynn C.; and Thomas, William B. Root cellar. 3,938,284, Cl. 52-20.000.

Brodie, Inc.: *See—*
Veale, Robert E., 3,938,447.

Brotzmann, Karl: *See—*
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; Savard, Guy; and Lee, Robert, 3,938,790.

Broughton, John N.: *See—*
Henderson, Cyril; and Broughton, John N., 3,938,859.

Brown, Donald R.: *See—*
Berg, Richard D.; Brown, Donald R.; Masopust, Otto T., Jr.; and Stoltz, James F., 3,939,440.

Brown, Edward A., to G. D. Searle & Co. 4',5'-Dihydrospiro[androst/estr-4-ene-17,2'(3'H)-furan]3,4'-dione and congeners, and intermediates thereto. 3,939,155, Cl. 260-239.55R.

Brown, Gordon E., to Monsanto Company. Fire-retardant particle board and binder therefor from aminoplast with ammonium polyphosphate-formaldehyde product. 3,939,107, Cl. 260-17.300.

Brown, John, to Qantix Corporation. Front projection screen made from a transparent material. 3,938,876, Cl. 350-128.000.

Brown, John Graham; and Stocker, John Peter, to International Standard Electric Corporation. Electrical push-button switch. 3,939,318, Cl. 200-159.00R.

Brown, Neil F.: *See*—
Krier, Keith N.; Brown, Neil F.; and Waldhauser, Steven J. A., 3,938,212.

Brown, Neil L., to United States of America, Navy. Conductivity cell and measuring system. 3,939,408, Cl. 324-30.00B.

Brownfield, Swayze W. Sound multiplier. 3,938,616, Cl. 181-136.000.

Browning-Ferris Industries, Inc.: *See*—
Cradeur, Robert R.; and Cardone, John E., 3,938,535.

Brundin, Bengt: *See*—
Risberg, Sture; Lindgren, Alf; Rixon, Kjell; Wallden, Rickard; and Brundin, Bengt, 3,939,420.

Bruntink, Lammert: *See*—
Lohn, Klaus; Lutteke, Georg; Schiefer, Gerd; Bruntink, Lammert; Groenewegen, Paulus Petrus Maria; Weinerth, Hans Viktor; Zwijsen, Wilhelmus Antonius Joseph Marie; and Rooij, Karel Petrus Van, 3,939,429.

Brusic, Vlasta; and Lussow, Robert O., to International Business Machines, Corporation. Method for passivating chromium. 3,939,293, Cl. 427-403.000.

Bryant Grinder Corporation: *See*—
Schroeder, Roger L., 3,939,453.

BTR Industries Limited: *See*—
Smith, Edward Peter, 3,938,774.

Bucalo, Louis. Implant and implanting method and tool. 3,938,499, Cl. 128-1.00R.

Bucalo, Louis, to Investors in Ventures, Inc. Implanting and splicing articles and methods for living beings. 3,938,528, Cl. 128-334.00C.

Buchner, Werner: *See*—
Lucking, Hans Joachim; Seyfried, Klaus; Buchner, Werner; and Rudolph, Karl-Heinz, 3,939,195.

Buckland, Bonnie P. Combination tie rack. 3,938,667, Cl. 211-87.000.

Buckner, Horst E. Oral appliance for burn patients. 3,938,508, Cl. 128-76.00R.

Bugg, John W. J.: *See*—
Epstein, David; Watkins, Leslie A.; and Bugg, John W. J., 3,938,578.

Buhler, Wolfgang: *See*—
Kirsch, Ulrich; and Buhler, Wolfgang, 3,938,370.

Bultmann, Holger: *See*—
Studeny, Hermann; and Bultmann, Holger, 3,938,818.

Burger, John H.; McClelland, John R.; and Dunkle, Robert P., to Armco Steel Corporation. Annealing furnace base plate supports. 3,939,296, Cl. 13-25.000.

Burger, Norman D., to Burger, Norman D.; and Mardesich, Nicholas, part interest to each. Aerosol dispensing system. 3,938,708, Cl. 222-95.000.

Burkhart, Charles W.: *See*—
Albaric, Jacques E.; Burkhart, Charles W.; and Jones, Warren W., 3,939,368.

Burkl, Erich: *See*—
Schurger, Rainer; Walter, Lothar; and Burkl, Erich, 3,938,862.

Burlington Industries, Inc.: *See*—
Lewey, Ernest L.; Sharpe, Ned K.; and Sloan, James F., 3,938,671.

Burmester, Kurt; Wolff, Siegfried; Klotzer, Erhard; and Thurn, Friedrich, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Vulcanizable rubber mixture for tire treads having improved skid resistance. 3,938,574, Cl. 152-330.00R.

Burrell, Julius W., to Raymond Lee Organization, Inc., The, a part interest. Sock and shoe. 3,938,264, Cl. 36-1.000.

Burroughs Corporation: *See*—
Sargunar, John E., 3,938,757.

Burroughs Wellcome Co.: *See*—
Hodson, Harold Francis; and Batchelor, John Frederick, 3,939,173.
Hodson, Harold Francis; and Batchelor, John Frederick, 3,939,276.
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Stuart, Alexander, 3,939,160.

Busch, Karl Alexander: *See*—
Radermacher, Gunter; and Busch, Karl Alexander, 3,938,625.

Butler, Edward A.: *See*—
Hecker, Richard; and Butler, Edward A., 3,938,463.

Butler, Robert C., to Raymond Lee Organization, Inc., The, a part interest. Spill-proof drinking container. 3,938,690, Cl. 220-90.400.

Buttermann, Gotz, to Schering Aktiengesellschaft. Radioactive functional diagnostic agents. 3,939,204, Cl. 260-518.00A.

Byers Photo Equipment: *See*—
Petry, Chester H., Jr.; and Hensley, J. Carl, 3,939,026.

Bytkin, Vitaly Nikolaevich: *See*—
Bobylev, Vitaly Petrovich; Kravtsov, Alexandr Feodosievich; Bytkin, Vitaly Nikolaevich; and Bershtein, Ruvim Semenovich, 3,938,787.

C.A.V. Limited: *See*—
Chalmers, Brian John; and Gibson, John Philip, 3,939,392.
Peltret, Pierre Henri, 3,938,487.

C. G. Doris: *See*—
Lamy, Jacques Edouard, 3,938,343.

C. Sherman Johnson Co., Inc.: *See*—
Johnson, Curtiss S., Jr., 3,938,844.

Calbo, Leonard Joseph, Jr., to American Cyanamid Company. Thermosetting toluene-soluble water-insoluble alkylated urea-formaldehyde resin and process for the manufacture thereof. 3,939,121, Cl. 260-70.00A.

Caldwell, Harold B., to Whiting Corporation. Process and apparatus for manufacturing phosphoric acid. 3,939,248, Cl. 423-166.000.

Camardella, Giuseppe. Machine tool with intermittently rotatable turret, more particularly a coil winder, and method of operating same. 3,938,748, Cl. 242-7.090.

Camelon, Melville J.; and Gibeau, Rodney C., to Ford Motor Company. Powder paints containing aluminum and nickel I. 3,939,114, Cl. 260-42.140.

Camp, Vernon Doyle; and Payne, Harry R., to Cavalier Corporation. Multi-rack article dispensing apparatus. 3,938,700, Cl. 221-109.000.

Campbell, John Stewart; Farmery, Keith; Heath, David John; and Harbord, Norman Henry, to Imperial Chemical Industries Limited. Catalytic process. 3,939,104, Cl. 252-455.00R.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Coleman, John Ralph; and Valand, Torstein, 3,939,010.

Canadian Patents and Development Limited: *See*—
Malcolm, J. Douglas, 3,938,557.

Cannalte, Gary A.; Crouse, Richard J.; Koenig, Richard D.; Rollins, Thomas J.; and Walker, Donald L., to Motorola, Inc. Emergency communications system. 3,939,417, Cl. 325-5.000.

Cannon, Robert B. Heat transfer apparatus. 3,938,233, Cl. 29-157.30R.

Canon Kabushiki Kaisha: *See*—
Uchidoi, Masanori; and Yamada, Tateo, 3,938,886.

Caramanian, Adele Jeannette, executrix: *See*—
Caramanian, Ara, deceased; and Caramanian, John A., 3,939,020.

Caramanian, Ara, deceased (by Caramanian, Adele Jeannette, executrix); and Caramanian, John A., to Caramanian, John A. Method of balancing a rotor. 3,939,020, Cl. 156-64.000.

Caramanian, John A.: *See*—
Caramanian, Ara, deceased; and Caramanian, John A., 3,939,020.

Carbonell, Nelson P.; and Perry, Roger L., to Gillette Company, The. Shaving system with pivotal head. 3,938,247, Cl. 30-47.000.

Cardenes Armas, Gregorio. Fuel oil burning method. 3,938,933, Cl. 431-4.000.

Carder, Charles H.; and Borden, George W., to Union Carbide Corporation. Acrylyl-terminated urea-urethane compositions. 3,939,126, Cl. 260-77.5CR.

Cardone, John E.: *See*—
Cradeur, Robert R.; and Cardone, John E., 3,938,535.

Carl Freudenberg, Firma: *See*—
Forch, Hans, 3,938,813.

Carlile, Norman John; and van Selm, Theodorus Johannes, to Lever Brothers Company. Food product. 3,939,282, Cl. 426-603.000.

Carlson, Elmer A., to International Telephone and Telegraph Corporation. Ignition system and components thereof. 3,938,938, Cl. 431-78.000.

Carlton, Ronald C. Storage means for motorcycles and like vehicles. 3,938,719, Cl. 224-36.000.

Carmody, John Maurice, to Republic Packaging Corporation. Packing brace. 3,938,661, Cl. 206-523.000.

Carnes, W. Robert; Balogh, John J., Jr.; and Selnick, Lester L., to Pitney-Bowes, Inc. Circuit for sorting currency. 3,938,663, Cl. 209-73.000.

Carrier Corporation: *See*—
Vizmeg, George, 3,938,936.

Carter, James L.: *See*—
Sinfelt, John H.; and Carter, James L., 3,939,062.

Carter, William E., Sr., to Thermo-Kinetics, Inc. High velocity filter. 3,938,970, Cl. 55-276.000.

Castleberry, William R. Rack assembly. 3,938,666, Cl. 211-49.00D.

Caterpillar Tractor Co.: *See*—
Anderson, Michael L.; Folwer, Harold W.; and McKie, David A., 3,938,215.
Beil, Richard C., 3,938,376.
Kershaw, Samuel L.; and Proeschl, Bernard E., 3,938,238.
Shelby, Robert L.; and Oestmann, Eldon D., 3,938,851.
Turner, Leland D.; and Smith, Donald L., 3,938,770.
Vinton, David S., 3,938,669.
Yancey, John W., 3,938,606.

Catteau, Jean. Case for displaying notices. 3,938,269, Cl. 40-30.000.

Cavalier Corporation: *See*—
Camp, Vernon Doyle; and Payne, Harry R., 3,938,700.

Cavaterra, Enrico; Petrera, Donato; Pignataro, Francesco; and Colucci, Gabriele, to Montedison S.p.A. Process for preparing methacrolein from isobutene and oxygen. 3,939,208, Cl. 260-604.00R.

Cecil, Richard R.: *See*—
Paynter, John D.; and Cecil, Richard R., 3,939,061.

Celanese Corporation: *See*—
Abella, Richard M.; Dodson, Keith D.; and Richardson, Jerry G., 3,938,924.
Richardson, Peter C., 3,939,096.

Centralny Osrodek Badan i Rozwoju Techniki Kolejnictwa: *See*—
Marszalek, Leszek; Lorenc, Tadeusz; and Hodbod, Andrzej, 3,938,629.

Centre de Recherche Industrielle de Quebec: *See*—
Rioux, Jacques E.; Turp, Gerald; and Jacques, Francois, 3,938,527.

Centre National d'Etudes Spatiales: *See—*
Ribes, Andre Auguste, 3,939,304.
Centro Sperimentale Metallurgico S.p.A.: *See—*
Imberti, Bruno, 3,938,791.
Chacon, Rene Aragon. Sprinkler head cleaning device. 3,938,249, Cl. 30-300.000.
Chalmers, Brian John; and Gibson, John Philip, to C.A.V. Limited. Inverters. 3,939,392, Cl. 321-11.000.
Channell, William H. Fixed count underground cable terminal. 3,939,301, Cl. 174-72.00R.
Chase Brass & Copper Co., Incorporated: *See—*
Aylard, William F.; and Blank, Albert I., 3,939,297.
Cherney, Steven D.: *See—*
Hau, Thomas J.; and Cherney, Steven D., 3,939,100.
Chesebrough-Pond's, Inc.: *See—*
Tusa, Philip; and Tranner, Frank, 3,939,099.
Chesley, Ronald F.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,938,277.
Chevron Research Company: *See—*
Backsai, Robert, 3,939,201.
Comfort, Armand C.; and Messner, Harold D., 3,938,386.
Gardner, John D.; and Manning, John F., 3,939,183.
Goldschmidt, Alfred; and Stayner, Robert A., 3,939,088.
Kobzina, John W., 3,938,985.
Cheylan, Etienne: *See—*
Belliot, Christian; Cheylan, Etienne; Madelaine, Serge; and Ebbing, Johannes, 3,939,103.
Chicago Metal Mfg. Co.: *See—*
Wendt, William H., III; and Krieps, George D., 3,938,235.
Chiellini, Enzo: *See—*
Console, Luciano; Bencini, Ferdinando; and Chiellini, Enzo, 3,939,120.
Chipps, Elmer Thomas: *See—*
McDavid, James E., Jr.; Truesdell, Stanley E.; and Chipps, Elmer Thomas, 3,938,698.
Chori Company Limited: *See—*
Kawasaki, Kentaro; and Takizawa, Keizo, 3,938,227.
Christensen Diamond Products Company: *See—*
Jurgens, Rainer; and Ostertag, Alfred, 3,938,853.
Christiansen, Soren Bent, to F. L. Smidth & Co. Method and apparatus for burning pulverulent materials. 3,938,949, Cl. 432-14.000.
Christoph, Dieter: *See—*
Jonelis, Robert E.; Christoph, Dieter; and Schulz, Siegfried, 3,938,411.
Chrysler Corporation: *See—*
Oda, Roy; De Frayne, Garry O.; and Walker, Paul L., 3,939,337.
Ciba-Geigy AG: *See—*
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Ciba-Geigy Corporation: *See—*
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Franke, Albrecht; and Traber, Walter, 3,939,274.
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Citizen Watch Co., Ltd.: *See—*
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Citrin, Paul, to Eastman Kodak Company. Manipulator. 3,938,402, Cl. 74-491.000.
Claesson, Harry; and Traff, Anders, to Allmanna Svenska Elektriska Aktiebolaget. Press containing a pressure cell with a flexible diaphragm and a forming pad influenced by said diaphragm. 3,938,361, Cl. 72-63.000.
Clark Equipment Company: *See—*
Bauer, James J., 3,938,401.
Frost, Barry L., 3,938,634.
Koch, Stanislaus H., 3,938,605.
Clark, Morton L., to Guaranteed Weather, Inc. Cooking apparatus. 3,938,494, Cl. 126-41.00R.
Clark, William H.: *See—*
Bennett, Max E.; McCanse, James Edson; Lawson, Gordon L.; and Clark, William H., 3,938,681.
Clarke-Gravely Corporation: *See—*
Hommes, Jack L., 3,938,217.
Clausi, Adolph Scott; Glicksman, Martin; and Farkas, Elizabeth, to General Foods Corporation. Spoonable frozen gelatin dessert concentrate. 3,939,001, Cl. 106-136.000.
Clavenna, LeRoy R.: *See—*
Longo, John M.; and Clavenna, LeRoy R., 3,939,008.
Clayton, John Peter: *See—*
Ferres, Harry; and Clayton, John Peter, 3,939,180.
Clayton Manufacturing Co.: *See—*
Converse, Vernon G., III; Cline, Edwin L.; and Tinkham, Leland P., 3,938,377.
Cleveland, Joseph J.: *See—*
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Cline, Edwin L.: *See—*
Converse, Vernon G., III; Cline, Edwin L.; and Tinkham, Leland P., 3,938,377.
Clucker, Richard V.; and Kennedy, Roland R., to Harsco Corporation. Control system for refuse handling apparatus. 3,938,679, Cl. 214-83.300.
Cobb, Bruce. Furniture formed of tubular elements. 3,938,860, Cl. 297-440.000.
Cohen, Milton J. Mechanical fluid and paste dispenser. 3,938,706, Cl. 222-83.500.
Cohlman, Donald C., to Motorola, Inc. Muting circuit for a radio receiver. 3,939,431, Cl. 325-478.000.
Coit, Roland L.; and Slebodnick, Robert G., to Westinghouse Electric Corporation. Deaerating feedwater heater. 3,938,588, Cl. 165-113.000.
Colberg, Kenneth Herman; and Zukowski, Ronald Joseph, to American Can Company. Aqueous polyelectrolytic electrocoating materials of organic resins. 3,939,110, Cl. 260-29.6ME.
Coleman, Arthur; and Garland, Ronald M., to Veeder Industries, Inc. Fuel pump computer conversion means. 3,938,736, Cl. 235-94.00R.
Coleman Company, Inc., The: *See—*
Madison, George Benjamin, 3,938,718.
Coleman, Donald D.; and Racine, Raymond F., to Rockwell International Corporation. Fully-coherent multiple frequency radar system. 3,939,474, Cl. 343-7.700.
Coleman, Edgar Padbury. Devices for making fluid-tight joints between two relatively rotating parts. 3,938,812, Cl. 277-41.000.
Coleman, John Ralph; and Valand, Torstein, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Manganese dioxide cathode. 3,939,010, Cl. 136-114.000.
Colgate-Palmolive Company: *See—*
Barth, Jordan B., 3,939,261.
Zmoda, Barney J., 3,939,090.
Collar, Roland W., to Techon Systems, Inc. Gas pressure actuated plastic squeeze dispenser and valving means therefor. 3,938,709, Cl. 222-95.000.
Collier, William S., to Raymond Lee Organization, Inc., The, a part interest. Sliding window lock. 3,938,839, Cl. 292-258.000.
Collins, Dean Robert, to Texas Instruments Incorporated. Wrist watches. 3,938,318, Cl. 58-50.00R.
Colucci, Gabriele: *See—*
Cavaterra, Enrico; Petrera, Donato; Pignataro, Francesco; and Colucci, Gabriele, 3,939,208.
Combustion Engineering, Inc.: *See—*
Prestridge, Floyd L.; and Wallace, Harry G., 3,939,395.
Comfort, Armand C.; and Messner, Harold D., to Chevron Research Company. Method and apparatus for monitoring temperatures during catalytic regeneration from a continuously moving infrared scanning and detection unit fixedly mounted aboard an aircraft. 3,938,386, Cl. 73-355.00R.
Compagnie Francaise Thomson Houston-Hotchkiss Brandt: *See—*
Belliot, Christian; Cheylan, Etienne; Madelaine, Serge; and Ebbing, Johannes, 3,939,103.
Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie: *See—*
Boileau, Jacques, 3,938,575.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Mary, Jacques; and Merillou, Pierre, 3,939,481.
Compensating Tension Controls, Inc.: *See—*
Taitel, Charles M.; and Ryan, Ralph L., 3,939,032.
Concrete Pipe Machinery Company: *See—*
Walchek, Ronald J., 3,938,685.
Conn, Gordon A.; and Gass, William R., to Westinghouse Electric Corporation. Method of electroforming on a metal substrate. 3,939,046, Cl. 204-4.000.
Conner, Claude Milton: *See—*
Jones, Allen Paul, Jr.; Knopf, Robert John; and Conner, Claude Milton, 3,939,105.
Consiglio Nazionale Della Ricerche: *See—*
Strumia, Franco; and Beverini, Nicola, 3,938,877.
Console, Luciano; Bencini, Ferdinando; and Chiellini, Enzo, to Societa' Italiana Resine S.p.A. Acrylonitrile copolymers suitable for making flame-resisting fibers. 3,939,120, Cl. 260-63.0HA.
Console, Luciano; Zecchin, Alessandro; and Quarta, Antonio, to Societa' Italiana Resine S.I.R. S.p.A. Catalytic process for preparing polymers and copolymers of acrylonitrile. 3,939,134, Cl. 260-85.50R.
Conti, Paolo, to Billi, S.p.A. Method of knitting a plurality of convergent tubular portions and resulting article. 3,938,355, Cl. 66-95.000.
Continental Can Company, Inc.: *See—*
Herbst, Edward J., 3,938,696.
Patel, Anil U.; DePhillips, James V.; and Peyser, Harry A., 3,938,693.
Continental Oil Company: *See—*
Essmeier, Donald E., 3,938,600.
Contois, Lawrence E.: *See—*
Reynolds, George A.; Van Allan, James A.; and Contois, Lawrence E., 3,938,994.
Converse, Vernon G., III; Cline, Edwin L.; and Tinkham, Leland P., to Scans Associates, Inc.; and Clayton Manufacturing Co., part interest to each. Method and apparatus for production hot testing of engines under load. 3,938,377, Cl. 73-117.000.
Cook, Barry, to Ciba-Geigy Corporation. 4-Piperidine acetamides. 3,939,168, Cl. 260-293.770.
Cook, Melvin S., to Holobeam, Inc. Adhesive system. 3,938,266, Cl. 36-19.500.

Cook, Ralph L.: *See—*
Dooley, James K.; and Cook, Ralph L., 3,938,440.
Cook, Rufus L.; and Warner, Henry L., to United States of America, Navy. Transducer. 3,939,467, Cl. 340-8.00R.
Cope, Geoffrey Wilton, to Dresser Industries, Inc. Derailment detector. 3,938,765, Cl. 246-172.000.
Coplastix Limited: *See—*
Hope, Bernard Francis, 3,938,548.
Coppersmith, Morris, to Packaging Aids, Inc. Pouring spout dispensing system. 3,938,714, Cl. 222-525.000.
Coppock, Walter J.; Amaroso, James R.; and Griffith, John Q., III, to Sun Oil Company of Pennsylvania. Textile-machinery lubricant composition. 3,939,083, Cl. 252-42.000.
Corbett, Luke W., to Exxon Research and Engineering Company. Asphalt paving compositions from positive spot asphalt fractions. 3,939,004, Cl. 106-273.00R.
Cornelius Company, The: *See—*
Birrell, Peter Leslie, 3,938,639.
Corning Glass Works: *See—*
Lanier, Terry O.; and Martha, Eugene F., 3,938,957.
Lanier, Terry O.; and Martha, Eugene F., 3,938,958.
Lanier, Terry O., 3,938,961.
Lartigue, Donald J.; and Weetall, Howard H., 3,939,041.
Corson, Blake W., Jr., to United States of America, General Counsel-Code GP. Cascade plug nozzle. 3,938,742, Cl. 239-265.110.
Cosden Oil & Chemical Company: *See—*
Hahn, Granville J., 3,939,236.
Cosentino, Louis C.: *See—*
Birnbaum, Michael R.; and Cosentino, Louis C., 3,938,506.
Cotter, William L. Writing apparatus. 3,939,482, Cl. 346-139.00C.
Coucher, Robert G., to Hogle-Kearns International. Plasma surgery. 3,938,525, Cl. 128-303.100.
Coulter Electronics, Inc.: *See—*
Hogg, Walter R., 3,939,409.
Cox, Clyde H. Sludge dewatering. 3,938,434, Cl. 100-117.000.
Cradeur, Robert R.; and Cardone, John E., to Browning-Ferris Industries, Inc. Tube cleaning device. 3,938,535, Cl. 134-167.00C.
Craig, Burnie M., to Fond, Loren S. Toothbrush with dentifrice cartridge. 3,938,897, Cl. 401-155.000.
Craig, Charles H., to Hickory Springs Manufacturing Company. Rocker spring unit. 3,938,857, Cl. 297-263.000.
Cramer, Thomas P. Aspirating system. 3,938,705, Cl. 222-59.000.
Crandell, Paul A.: *See—*
Kozul, Theodore L.; and Crandell, Paul A., 3,939,446.
Craven, Truxtun; Crecelius, Carlyle A.; and Philbrick, Clayton W., to Oly npic Instruments Inc. Level wind for winch. 3,938,781, Cl. 254-175.700.
Creators Limited: *See—*
Stent, Vernon Dennis; and Wright, Derek Cecil, 3,938,929.
Crecelius, Carlyle A.: *See—*
Craven, Truxtun; Crecelius, Carlyle A.; and Philbrick, Clayton W., 3,938,781.
Cresswell, Ronald M.: *See—*
Mentha, John W.; Shaffner, Janice V.; and Cresswell, Ronald M., 3,939,181.
Crissman, Jay W., to Raymond Lee Organization, Inc., The, a part interest. Location indicating device. 3,938,466, Cl. 116-124.00R.
Criswell, Homer C. Glazing panel support system. 3,938,291, Cl. 52-731.000.
Crocker, Earle B., Jr., to General Electric Company. Quick settling gyrocompass having interaxis decoupling compensation for improved response time. 3,938,256, Cl. 33-324.000.
Croese, Hendrik Magchiel Willem. Floating unloading installation for lighters. 3,938,676, Cl. 214-13.000.
Cromwell, John E., to Koppers Company, Inc. Bearing member having a wear resistant coating on its bearing face. 3,938,814, Cl. 277-235.00A.
Crooks, Robert Clement Allen, to Norlin Music, Inc. Reverberation mixer circuit. 3,939,305, Cl. 179-1.00J.
Crosby, Philip Stephen, to Tektronix, Inc. Wideband DC current amplifier. 3,939,434, Cl. 330-40.000.
Crouse-Hinds Company: *See—*
Norris, George W., 3,938,767.
Crouse, Richard J.: *See—*
Cannalte, Gary A.; Crouse, Richard J.; Koenig, Richard D.; Rollins, Thomas J.; and Walker, Donald L., 3,939,417.
Crowe-Gulde, Inc.: *See—*
Salts, Thomas R., 3,939,238.
Crucible Inc.: *See—*
Powell, Joseph W.; and Fleck, James N., 3,939,241.
Crull, Wolfgang: *See—*
Kalko, Jurgen; and Crull, Wolfgang, 3,938,537.
Crute, Billy G., to Stant Manufacturing Company, Inc. Pressure-vacuum relief fuel tank cap with roll-over safety valve feature. 3,938,692, Cl. 220-203.000.
Cryogenics Corporation of America: *See—*
Martin, Patrick S.; and Moody, Barron M., 3,938,350.
Csukas, Bela: *See—*
Ormos, Zoltan; Csukas, Bela; Stefko, Bela; Pataki, Karoly; Blickle, Tibor; and Felmeri, Jozsef, 3,938,259.
Cullen, Arthur Prosper. Covering or blanketing liquid surfaces and float members for effecting same. 3,938,338, Cl. 61-1.00R.
Curtis International, Inc.: *See—*
Curtis, Thomas W.; and Bresnahan, Roger M., 3,939,456.
Curtis, Thomas W.; and Bresnahan, Roger M., to Curtis International, Inc. Heating plant monitor system. 3,939,456, Cl. 340-213.00R.
Cuthbert, Victor W.: *See—*
Brenner, Robert A.; and Cuthbert, Victor W., 3,938,260.
Cutter Laboratories, Inc.: *See—*
Kahn, Paul; and Stubstad, James A., 3,938,198.
Cyprus Metallurgical Processes Corporation: *See—*
Kazel, William G., 3,939,256.
Dach, Hansjorg; Furtner, Horst; and Marion, Robert, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Hydraulic actuating system for a pair of concurrently operating clutches or brakes. 3,938,410, Cl. 74-869.000.
Daihatsu Motor Company Limited: *See—*
Kensaku, Yano; Makoto, Kurose; and Toshiaki, Nagamitsu, 3,938,609.
Daikin Kogyo Co., Ltd.: *See—*
Ueno, Takeo, 3,938,349.
Daimler-Benz Aktiengesellschaft: *See—*
Patzelt, Helmut, 3,938,824.
Dakss, Mark L.: *See—*
Bridger, Andrew; and Dakss, Mark L., 3,938,895.
Dalmasso, Claudio, to Ing. C. Olivetti & C., S.p.A. Liquid crystal devices. 3,938,879, Cl. 350-160.0LC.
D'Amato, Ralph James, to RCA Corporation. Spring mount for a cathode ray tube yoke. 3,939,447, Cl. 335-210.000.
Damon Corporation: *See—*
Lehman, Ivan L., 3,938,354.
Danyi, Edit: *See—*
Biro, Oszkar; Danyi, Edit; Fenyvesi, Magdolna; and Pamuk, Janos, 3,939,443.
Darrington, Franklin D.: *See—*
Akin, Cavit; Flannery, Robert J.; and Darrington, Franklin D., 3,939,284.
Dashew, Stephen S., to Interform Inc. Method for sealing and stripping a concrete form. 3,939,234, Cl. 264-31.000.
Data Source Corporation: *See—*
Humphrey, John H., 3,939,327.
David, Melvin J. Blind rivet assembly. 3,938,657, Cl. 206-343.000.
Davies, David Aubrey; and Johnson, Dennis Sydney, to Automotive Products Co., Ltd. Driven plates for friction clutches. 3,938,635, Cl. 192-106.200.
Davis, Charles W.: *See—*
Salzgeber, Daniel; Raufeisen, Robert; and Davis, Charles W., 3,938,911.
Davis, Guy E., to Westinghouse Electric Corporation. Control system with adaptive process controllers especially adapted for electric power plant operation. 3,939,328, Cl. 235-150.100.
Davis, James L.; Lopke, Edward L.; and Huellmantel, Louis W., to General Motors Corporation. Gas turbine control. 3,938,321, Cl. 60-39.250.
Dawson, David H., to Dow Chemical Company, The. Tube treating and method. 3,939,243, Cl. 264-296.000.
Dayton Progress Corporation: *See—*
Stevens, Harry G.; and Randolph, Allan E., Sr., 3,938,794.
DeAmicis, Ferdinando. Extensible cleaning tool. 3,938,218, Cl. 15-401.000.
Deards, Henry Charles; and Pickford, Nigel Evans, to Imperial Chemical Industries Limited. Collapsible container. 3,938,728, Cl. 229-14.00B.
de Bok, Adriaan, to ITT Industries, Inc. Arrangement for controlling the viscosity of a fluid. 3,938,369, Cl. 73-55.000.
de Bree, Siegfried Emilius Maria, to N.V. Industrieele Handelscombinatie Holland. Pump. 3,938,908, Cl. 415-196.000.
DeCorso, Serafino M.; and Seglem, Clifford E., to Westinghouse Electric Corporation. Catalytic combustor having a variable temperature profile. 3,938,326, Cl. 60-39.74R.
Deere & Company: *See—*
Bichel, Darwin Carl, 3,938,683.
Mutziger, John Stefan, 3,939,405.
Penfold, Garn Farley; and Redman, Andrew Paul, 3,938,566.
Quoiffy, Harald; and Kuhn, Norbert, 3,938,684.
Deering Milliken Research Corporation: *See—*
Wethington, Charles A.; and Littlejohn, David G., 3,939,030.
Defalco, Gianfranco: *See—*
Zambolin, Adriano; and Defalco, Gianfranco, 3,938,644.
De Frayne, Garry O.: *See—*
Oda, Roy; De Frayne, Garry O.; and Walker, Paul L., 3,939,337.
DeHart, Arnold O.; Rosenberg, Richard C.; and Trachman, Edward G., to General Motors Corporation. Load supporting lubricant. 3,939,081, Cl. 252-12.000.
Deise, Louis F., to Westinghouse Electric Corporation. Dynamic antenna tuner. 3,939,422, Cl. 325-163.000.
Delahousse, Philippe J.: *See—*
Delahousse, Regis J.; and Delahousse, Philippe J., 3,938,224.
Delahousse, Regis J.; and Delahousse, Philippe J., to Etablissements Delahousse et Bruant. Devices for use in the manufacture of articles of upholstery. 3,938,224, Cl. 24-102.00T.
Delap, Joseph A.: *See—*
Hogan, John P.; Nasser, Benny E.; and Delap, Joseph A., 3,939,137.
Delfiol, Lucio; and Marizzoli, Luigi, to Industrie Pirelli S.p.A. Accessory annular elements for textile machinery and relative manufacturing process. 3,938,399, Cl. 74-232.000.
Del Vesco, Adriano: *See—*
Frangioni, Alessandro; Venturino, Giovanni; Morandi, Giorgio; and Del Vesco, Adriano, 3,938,982.

De Marinis, Robert M.; and Hoover, John R. E., to SmithKline Corporation. Substituted sulfonylacetamido cephalosporins. 3,939,266, Cl. 424-246.000.

Demerson, Christopher A.; Humber, Leslie G.; Dobson, Thomas A.; and Jirkovsky, Ivo L., to American Home Products Corporation. Certain pyrano [3,4-b]indoles and thiopyrano[3,4-b]indoles. 3,939,178, Cl. 260-326.280.

de Munnik, Nicholas Marie. Processing tank. 3,938,689, Cl. 220-71.000.

Dennis, Ronnie D.: *See—*
Lawson, John E.; Dennis, Ronnie D.; and Majewski, Robert F., 3,939,196.

Densow, Ulrich O., to Outboard Marine Corporation. Chain saw oil pump with overload protection. 3,938,622, Cl. 184-15.00R.

DePhillips, James V.: *See—*
Patel, Anil U.; DePhillips, James V.; and Peyser, Harry A., 3,938,693.

DePree, David O.: *See—*
Katzakian, Arthur, Jr.; and DePree, David O., 3,939,071.

Derkach, Nikolai Dmitrievich: *See—*
Ivanov, Evgeny Illarinovich; Olthow, Viktor Semenovich; Kostyrya, Evgeny Dmitrievich; and Derkach, Nikolai Dmitrievich, 3,938,596.

Derks, Antonius Lambertus: *See—*
Kemkers, Pieter; and Derks, Antonius Lambertus, 3,938,228.

De Rosa, David. Electronic musical instrument. 3,938,419, Cl. 84-1.140.

Desalination Systems, Inc.: *See—*
Bray, Donald T., 3,939,074.

Detzel, Josef; and Bartels, Klaus Peter, to Lever Brothers Company. Food container. 3,938,730, Cl. 229-43.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Burmester, Kurt; Wolff, Siegfried; Klotzer, Erhard; and Thurn, Friedrich, 3,938,574.

Dewey, C. Forbes, Jr., to Massachusetts Institute of Technology. Detecting trace gaseous species acoustically in response to radiation from an intense light source. 3,938,365, Cl. 73-24.000.

Dewhirst, Geoffrey Wilson, to Thomson Shepherd and Company Limited. Method of making pile fabrics and the pile fabric made thereby. 3,938,559, Cl. 139-7.00R.

Dexter, Martin: *See—*
Schmidt, Andreas; Peterson, Janet B.; and Dexter, Martin, 3,939,175.

DiBella, Eugene P.; and Rudner, Bernard, to Tenneco Chemicals, Inc. Fire-retardant polyurethane resins prepared from side-chain halogenated aromatic polyisocyanates. 3,939,124, Cl. 260-77.5AT.

Dickens, Lawrence E.; and Maki, Douglas W., to Westinghouse Electric Corporation. Integrated circuit, image and sum enhanced balanced mixer. 3,939,430, Cl. 325-446.000.

Dickinson, Ben Wade Oakes, III; and Dickinson, Robert Wayne. Method for measuring vagina dimensions. 3,938,504, Cl. 128-2.00S.

Dickinson, Robert Wayne: *See—*
Dickinson, Ben Wade Oakes, III; and Dickinson, Robert Wayne, 3,938,504.

Didek, Stanislav; Storek, Jaroslav; Kubovy, Miloslav; Svec, Zdenek; Hrdina, Jan; and Kasparek, Jaromir, to Vyzkumny Ustav Bavlnarsky. Apparatus for separating fibers in open-end spinning machines. 3,938,310, Cl. 57-58.910.

Diepers, Heinrich; and Schmidt, Otto, to Siemens Aktiengesellschaft. Apparatus for the electrolytic polishing of niobium structures. 3,939,053, Cl. 204-212.000.

Diesel Kiki Co., Ltd.: *See—*
Aoki, Hachiro, 3,938,488.

Diessner, Armin: *See—*
Bitsch, Rainer; and Diessner, Armin, 3,939,410.

Dieterich, Dieter, to Bayer Aktiengesellschaft. Production of polyurethane plastics. 3,939,222, Cl. 260-858.000.

Dietzsch, Gunter; Frers, Gerd; and Wieland, Dieter, to Andreas Stihl Maschinenfabrik. Motor chain saw. 3,938,633, Cl. 192-48.300.

DiFede, Dominic. Scorecard washing device. 3,938,213, Cl. 15-77.000.

DiGiovanniantonio, Perry R., to United States of America, Navy. Space shuttle orbiter barricade. 3,938,763, Cl. 244-110.00C.

Dimeff, John, to United States of America, General Counsel-Code GP. Modulated hydrogen ion flame detector. 3,938,956, Cl. 23-254.0EF.

Dinbergs, Kornelius: *See—*
Schollenberger, Charles S.; and Dinbergs, Kornelius, 3,939,111.

Dini, Mamiliano, to European Rotogravure Association. Depth measuring apparatus using reflected ultrasonic beams. 3,938,371, Cl. 73-67.80S.

Dircksen, Arnold D.; and Dircksen, David H. Tractor mounted log splitter. 3,938,567, Cl. 144-193.00A.

Dircksen, David H.: *See—*
Dircksen, Arnold D.; and Dircksen, David H., 3,938,567.

Disselnkotter, Hans: *See—*
Konig, Hans-Bodo; Schrock, Wilfried; Disselnkotter, Hans; and Metzger, Karl Georg, 3,939,149.

Disston, Inc.: *See—*
Grimes, James E.; and Rovan, Joseph W., 3,939,362.

Ditto, Donald R.; and Hare, Kenneth H. Toy cannon. 3,938,272, Cl. 42-55.000.

Djokic, Slobodan: *See—*
Radobolja, Gorjana; Tamburasev, Zrinka; and Djokic, Slobodan, 3,939,144.

Dobson, Thomas A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Dobson, Thomas A.; and Jirkovsky, Ivo L., 3,939,178.

Dr. -Ing. h.c.F. Porsche Aktiengesellschaft Firma: *See—*
Sommerer, Karl, 3,938,405.

Dodanov, Alexandr Georgievich: *See—*
Vasiliev, Vsevolod Viktorovich; Dodanov, Alexandr Georgievich; Klepikova, Alla Nikolaevna; and Timoshenko, Anatoly Grigorievich, 3,939,336.

Dodson, Keith D.: *See—*
Abella, Richard M.; Dodson, Keith D.; and Richardson, Jerry G., 3,938,924.

Dombro, Robert A.: *See—*
Homeier, Edwin H.; and Dombro, Robert A., 3,939,213.

Dominick, George G.: *See—*
Weber, Leonard J.; Dominick, George G.; and Moustafa, Emad T., 3,938,733.

Dominion Foundries and Steel, Limited: *See—*
Tait, William H., 3,939,404.

Donadio, Vincent J., to United States of America, Army. Serrated supporting keying system for a beehive projectile. 3,938,442, Cl. 102-67.000.

Donaldson, James M., to Bowmar Instrument Corporation. Multiratio power transmitting device. 3,938,403, Cl. 74-217.0CV.

Donini, Enrico. Continuous metal casting plant with controlled band-tensioning. 3,938,580, Cl. 164-154.000.

Donnelly, Donald E., to Emerson Electric Co. Electrical coil assembly with means for securing external leads. 3,939,450, Cl. 336-90.000.

Donnet, Henry, to Ste. d'Application Plastique Mecanique et Electronique Plastimecanique. Machine for automatically producing optionally empty or filled packaging containers made of thermoplastic film material. 3,938,302, Cl. 53-167.000.

Dooley, James K.; and Cook, Ralph L., to Olin Corporation. Mixed propellant charge. 3,938,440, Cl. 102-38.000.

Doonan Trailer Corporation: *See—*
Bagwell, James H., 3,938,861.

Doran, J. Robert, to GTE Sylvania Incorporated. Interface means. 3,939,329, Cl. 235-151.100.

Dornauer, Horst; and Anderson, Vernon Brian, to American Hoechst Corporation. Spiro(pyrrolo (1,2-A)quinoxalines). 3,939,159, Cl. 260-250.00Q.

Dornier System GmbH: *See—*
Huf, Franz; and Lambrecht, Jurgen, 3,938,919.

Dorst-Keramikmaschinen-Bau: *See—*
Fleissner, Roland, 3,938,920.

Douglas, Bobby L., to Dresser Industries, Inc. Oil well pumpoff control system. 3,938,910, Cl. 417-12.000.

Dow Chemical Company, The: *See—*
Bredeweg, Corwin J., 3,939,212.
Dawson, David H., 3,939,243.
Stavropoulos, William S.; Thiegs, Bernard J.; and Mack, Robert F., 3,938,954.

Downs, Dallas I., to Southern California Edison Company. Fish holding chamber. 3,938,340, Cl. 61-21.000.

Doyle, David; and Shtulman, Murray M. Pick-proof lock. 3,938,358, Cl. 70-358.000.

Draa, Wayne A., to Gottschall Tool & Die, Inc. Mine roof bolt anchor construction. 3,938,420, Cl. 85-76.000.

Drabert, Fritz; and Geffers, Klaus. Chair with adjustable backrest. 3,938,858, Cl. 297-284.000.

Dreher, Karl D.: *See—*
Ossip, Paul S.; and Dreher, Karl D., 3,938,591.

Drescher, Gary Clyde. Swimmer's glove having joints bendable only in closing direction of the hand. 3,938,207, Cl. 9-308.000.

Dresser Industries, Inc.: *See—*
Cope, Geoffrey Wilton, 3,938,765.
Douglas, Bobby L., 3,938,910.

Dubach, Werner: *See—*
Luthi, Hanspeter; and Dubach, Werner, 3,938,807.

DuBois, R. Clark: *See—*
Vijayendran, Bheema R.; and DuBois, R. Clark, 3,939,087.

Dumas, Sarah J. Newspaper container. 3,938,691, Cl. 220-94.00A.

Duni Bila AB: *See—*
Andersson, Karl Gosta Bertil, 3,938,727.

Dunkle, Robert P.: *See—*
Burger, John H.; McClelland, John R.; and Dunkle, Robert P., 3,939,296.

Dunleavy, Raymond A.; and Hawker, Leslie E., to Union Carbide Corporation. Energy absorbing polyurethane-polyurea cellular elastomers. 3,939,106, Cl. 260-2.5AM.

Dunlop Limited: *See—*
Atkins, George; and Evans, Philip J., 3,938,921.
Mitchell, William Eric, 3,938,576.

Dunz, Erwin, to Fichtel & Sachs AG. Method of securing tubular bellows to a cylinder. 3,938,237, Cl. 29-450.000.

Du Pont de Nemours, E. I., and Company: *See—*
Arvidson, Harold C., Jr.; and Stottlemyer, Quayton Ray, 3,939,000.
Kane, William Paul, 3,939,025.
Lovendusky, Charles Michael; and Wallick, Charles William, 3,938,245.
Trammell, George Roy, 3,938,314.

Dupuy, Georges: *See—*
Michel, Max; and Dupuy, Georges, 3,939,250.

Durieux, Teddy, to Solvay & Cie. Apparatus for measuring out pulverulent materials. 3,938,712, Cl. 222-404.000.

Duwe, Edward C.; and Duwe, William E., to Duwe Precast Concrete Products, Inc. Apparatus including cammed fastening means for making modular crypts. 3,938,773, Cl. 249-27.000.

Duwe Precast Concrete Products, Inc.: *See—*
Duwe, Edward C.; and Duwe, William E., 3,938,773.

Duwe, William E.: *See—*
Duwe, Edward C.; and Duwe, William E., 3,938,773.

Dwyer, Stanley J., to Gulf Oil Corporation. Tanker hull modification. 3,938,457, Cl. 114-56.000.

Dye, Richard A.; and Rowley, Donald A., to Hughes Aircraft Company. Laser weapon simulator. 3,938,262, Cl. 35-25.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Studeny, Hermann; and Bultmann, Holger, 3,938,818.

Dynatherm Corporation: *See—*
Wadsworth, Gilbert A., Jr., 3,938,374.

Dziedzic, Chester J.; Kleiner, Richard N.; and Cleveland, Joseph J., to GTE Sylvania Incorporated. Apparatus and method for forming a sealed outer ring for ceramic regenerator. 3,938,923, Cl. 425-127.000.

Eastman Kodak Company: *See—*
Citrin, Paul, 3,938,402.
Gompf, Thomas Edward; and Faul, William Henry, 3,938,995.
Jadwin, Thomas A.; Khanna, Ravi; Merrill, Stewart H.; and Perry, Edmond S., 3,938,992.
Reynolds, George A.; Van Allan, James A.; and Contois, Lawrence E., 3,938,994.
Wang, Richard H. S.; and Irick, Gether, Jr., 3,939,115.
Wright, Roger L., 3,939,216.

Eaton Corporation: *See—*
Baremor, Jerry F., 3,938,408.
Giorgini, Gerardo; and Bocca, Giorgio, 3,938,826.

Ebbing, Johannes: *See—*
Belliot, Christian; Cheylan, Etienne; Madelaine, Serge; and Ebbing, Johannes, 3,939,103.

Eberle, William J., to General Battery Corporation. Automatic air leak testing apparatus. 3,938,368, Cl. 73-45.100.

Ebina, Riyuzo: *See—*
Nishitani, Kiyoshi; Kawada, Kimihiro; Ebina, Riyuzo; and Miyoshi, Katsunori, 3,938,448.

Ebrok, Vello H.: *See—*
Snygg, John; and Ebrok, Vello H., 3,938,918.

ECC Corporation: *See—*
Larson, Raymond E., 3,939,396.

Edelberg, Gustav Rudolf: *See—*
Holm, Bengt Lennart; and Edelberg, Gustav Rudolf, 3,939,385.

Edwards, Philip Neil, to Imperial Chemical Industries Limited. Alkylene bis(pyridiniumareylene quaternary salts). 3,939,169, Cl. 260-294.80R.

Egerton, Clinton F.: *See—*
Nagy, Nicholas; and Egerton, Clinton F., 3,938,545.

Eglseer, Franz: *See—*
Theurer, Josef; Hall, Keith L.; and Eglseer, Franz, 3,939,331.

Einarsson Ahlfors, Sten Eskil. Screening device. 3,939,065, Cl. 209-240.000.

Eisenwerk-Gesellschaft Maximilianshutte mbH: *See—*
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; Savard, Guy; and Lee, Robert, 3,938,790.

Ekimov, Vadim Petrovich: *See—*
Mogilevsky, Vitaly Moritsovich; Ekimov, Vadim Petrovich; Erastov, Alexandr Petrovich; and Posokhin, Viktor Vladimirovich, 3,939,402.

Ekstrom, Bertil Ake; and Sjoberg, Berndt Olof Harald, to Astra Lakemedel Aktiebolag. Pharmaceutical preparations containing α-aminopenicillins. 3,939,270, Cl. 424-271.000.

Elachi, Charles: *See—*
United States of America, National Aeronautics and Space Administration; and Elachi, Charles, 3,939,439.

Elbatainer Kunststoff- und Verpackungs- Gesellschaft m.b.H.: *See—*
Maier, Eckhard; Ostermeier, Heinrich; Kormendi, Kalman; and Schinke, Friedel, 3,938,687.

Electroglas, Inc.: *See—*
Roch, Jacques Leon, 3,939,414.

Electronic Data Controls Corporation: *See—*
Moreton, George C., 3,938,784.

Electronic Engineering Co. of California: *See—*
Keech, Eugene Elwin, 3,939,333.

Elert, Uwe: *See—*
Sacht, Hans Otto; Honhold, Joost; and Elert, Uwe, 3,938,652.

Eli Lilly and Company: *See—*
Lacefield, William B.; and Marshall, Winston S., 3,939,278.
Miesel, John L.; and Wickiser, David I., 3,939,166.

Elkay Manufacturing Company: *See—*
Farrell, Gerald J., 3,938,546.

Elser, Wolfgang; and Ruske, Manfred, to BASF Aktiengesellschaft. Anthrapyrimidine dyes. 3,939,162, Cl. 260-256.40Q.

Emerson Electric Co.: *See—*
Donnelly, Donald E., 3,939,450.

Emhart Corporation: *See—*
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Emhart Zurich S.A.: *See—*
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Emmel, Leroy L., to Fortin Laminating Corporation. Apparatus for insulating electrically conductive elements. 3,938,931, Cl. 425-505.000.

Emmons, William D.; and Levy, Jerome F., to Rohm and Haas Company. Aliphatic acyl-containing amine hydrochlorides. 3,939,200, Cl. 260-482.00R.

Engel, Joseph C., to Westinghouse Electric Corporation. Circuitry with zener diode voltage surge suppressor connected to serve as half wave rectifier. 3,939,363, Cl. 307-202.00R.

Engelbert, Harald, to Radiation Limited. Control systems for gaseous fuel fired appliances. 3,938,935, Cl. 431-47.000.

Engelhard Minerals & Chemicals Corporation: *See—*
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Engelsmann, Dieter: *See—*
Winkler, Alfred; Engelsmann, Dieter; Maas, Dieter; and Schroder, Rolf, 3,939,484.

Enlow, William Plamer: *See—*
Hechenbleikner, Ingenuin; and Enlow, William Plamer, 3,939,229.

Entin, Leonard P.: *See—*
Ross, Thorvald S., Jr.; and Entin, Leonard P., 3,938,731.

Epperson, Otis A.; and Smith, Raymond H., to Gerber Products Company. Loose flap detector and case ejector system for wrap-around paperboard cartons. 3,939,063, Cl. 209-7.000.

Epstein, David; Watkins, Leslie A.; and Bugg, John W. J., to White Sea & Baltic Company Limited, The. Method for making foundry moulds and cores utilizing a gas catalyst. 3,938,578, Cl. 164-16.000.

Erastov, Alexandr Petrovich: *See—*
Mogilevsky, Vitaly Moritsovich; Ekimov, Vadim Petrovich; Erastov, Alexandr Petrovich; and Posokhin, Viktor Vladimirovich, 3,939,402.

Erikson, Uno Eugen, to Siemens Aktiengesellschaft. Catheter for radiological renal aortography and selective arteriography. 3,938,501, Cl. 128-2.00A.

Ernst, Franklin Henry, Jr.; and Travaglio, Dalny. Selective imprinting machine. 3,938,662, Cl. 209-73.000.

Erspamer, James R., to Sperry Rand Corporation. Two-cycle compensator for flux valve heading repeater system. 3,938,257, Cl. 33-361.000.

Erwin, Ransome W., to Austral-Erwin Engineering Co. Heat exchangers and evaporators. 3,939,036, Cl. 159-47.00R.

Eschenmoser, Albert. Method for preparing aldehydes. 3,939,207, Cl. 260-601.00R.

Eskeli, Michael. Turbine with heating and cooling. 3,938,336, Cl. 60-682.000.

Eskofot A/S: *See—*
Nygaard, Sven; and Larsen, Rex Stemann, 3,938,887.

Essmeier, Donald E., to Continental Oil Company. Hydraulic mining nozzle-air lift device. 3,938,600, Cl. 175-422.000.

Etablissements Delahousse et Bruant: *See—*
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Ethyl Corporation: *See—*
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Evans, Philip J.: *See—*
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Everitt, Delmar K.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,938,277.

Ewald, Ronald F.; and Konarski, Raymond M., to Seaquist Valve Company. Self priming mechanism for dispenser. 3,938,711, Cl. 222-209.000.

Extel Corporation: *See—*
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Exxon Research and Engineering Company: *See—*
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Johnson, Burnett H.; and Henderson, Don J., 3,939,116.
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F. L. Smidth & Co.: *See—*
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Fa. Dietz-Druckguss KG.: *See—*
Bauer, Hans, 3,938,495.

Faggian, Gian Franco, to Ing. C. Olivetti & C., S.p.A. Desk-top electronic computer with MOS circuit logic. 3,939,452, Cl. 340-172.500.

Fairchild Camera and Instrument Corporation: *See—*
Snyder, Larry D.; and Hood, Robert B., 3,938,490.

Falk, Curt Gunnar; Strandell, Per-Olof; and Sundberg, Karl Lennart, to AB Metalform. Apparatus for the plastic working of material. 3,938,362, Cl. 72-225.000.

Falkenberg, Johan Caspar. Construction elements and sheet metal web strips therefor. 3,938,289, Cl. 52-618.000.

Fardzinov, Valery Kombolatovich: *See—*
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Farfaglia, Silvio T., to Phillips Petroleum Company. Gable-top carton transfer apparatus and method. 3,938,645, Cl. 198-20.00R.

Farkas, Elizabeth: *See—*
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Farmery, Keith: *See—*
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Farrar, Grover L.; and Storms, Phillip W., to Marathon Oil Company. Chlorinated naphthalene esters. 3,939,198, Cl. 260-469.000.

Farrell, Gerald J., to Elkay Manufacturing Company. Faucet with valve cartridge. 3,938,546, Cl. 137-454.200.

Fassbinder, Hans-Georg: *See—*
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; Savard, Guy; and Lee, Robert, 3,938,790.

Faul, William Henry: *See—*
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Fawcett, Sherwood L.; and Anno, James N., to Battelle Development Corporation. Apparatus for converting one form of energy into another form of energy. 3,938,337, Cl. 60-682.000.

Fedotov, Viktor Konstantinovich: *See—*
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Fehl, Anton; and Hoffmeister, Bernhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Gripping device of a lifting device, especially in a core reactor for depositing and picking up of fuel elements and control rods. 3,938,845, Cl. 294-86.00A.

Feilbach, Weston H.: *See—*
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Feilbach, Weston H., Jr.; and Baum, Charles S., to Feilbach, Weston H. Laminated composite wear materials. 3,938,962, Cl. 29-191.000.

Feiler, Leonard: *See—*
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Felmeri, Jozsef: *See—*
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Fenton, Frank Alan: *See—*
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Fenyvesi, Magdolna: *See—*
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Fernholz, Hans; Wunder, Friedrich; and Schmidt, Hans-Joachim, to Hoechst Aktiengesellschaft. Oxacylation of olefins in the gaseous phase. 3,939,199, Cl. 260-469.000.

Ferres, Harry; and Clayton, John Peter, to Beecham Group limited. Penicillin esters. 3,939,180, Cl. 260-239.100.

Ferro Corporation: *See—*
Montgomery, Paul B., 3,938,903.

F'Geppert, Erwin, to United States of America, Army. Chuck having jaw counterbalance mechanism. 3,938,815, Cl. 279-1.00C.

Fiber Controls Corporation: *See—*
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Fieldhouse, John William, to Firestone Tire & Rubber Company, The. Adhesives and their use. 3,939,294, Cl. 428-424.000.

Figueroa, Antonio Casas. Disc brake assembly. 3,938,628, Cl. 188-18.00A.

Fineman, Howard E.; Schlosser, Steven M.; Hill, Lawrence M.; and Hanson, Richard E., to United States of America, Army. Engine compression testing. 3,938,378, Cl. 73-117.200.

Finommechanikai Vallalat: *See—*
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Firestone Tire & Rubber Company, The: *See—*
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McGillvary, Daniel R.; and Sumerak, Joseph E., 3,938,562.
Roodvoets, Mark R., 3,939,133.

Firey, Joseph Carl. Gasoline engine torque regulator. 3,938,483, Cl. 123-90.120.

Fisch, Richard S.; and Newman, Norman, to Minnesota Mining and Manufacturing Company. Rapid access, air stable, regenerable iron chelate developer solutions. 3,938,997, Cl. 96-66.300.

Fisch, Richard S.; and Newman, Norman, to Minnesota Mining and Manufacturing Company. Low contrast, rapid access, air stable, regenerable iron chelate developer solutions. 3,938,998, Cl. 96-66.300.

Fischer, Adolf, to BASF Aktiengesellschaft. Herbicide. 3,938,984, Cl. 71-88.000.

Fitzsimmons, Raymond T.: *See—*
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Flavell, Evan R. Torque transducer utilizing differential optical sensing. 3,938,890, Cl. 356-119.000.

Fleck, Fritz: *See—*
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Fleck, James N.: *See—*
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Fleissner, Roland, to Dorst-Keramikmaschinen-Bau. Device for limiting the pressing force to a pre-established value in mechanical presses. 3,938,920, Cl. 425-78.000.

Flesch, Udo. Precision temperature transducer for measuring the surface temperature of the human and animal skin. 3,938,387, Cl. 73-359.000.

Fletcher, Kenneth John: *See—*
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Flo-Tite Plastics Corporation: *See—*
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Fluet, Francis A., to Westinghouse Electric Corporation. Vector conversion system. 3,939,330, Cl. 235-151.110.

FMC Corporation: *See—*
Raque, Glen F., 3,938,647.

Folco-Zambelli, Gian Matteo. Wheeled vehicle adapted to turn on the spot. 3,938,608, Cl. 180-21.000.

Folsom, Theodore R.; Parks, Gerald J., Jr.; and Weitz, William E., Jr., to United States of America, Navy. Automated precision flame-emission photometric apparatus. 3,938,888, Cl. 356-87.000.

Folwer, Harold W.: *See—*
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Fonne, Gunnar Johan, to Norsk Hydro A. S. Growth medium to cover the surface of the ground. 3,938,279, Cl. 47-9.000.

Foote, Kenneth R.; and Mamula, Michael, to United States of America, Navy. Flare cartridge. 3,938,444, Cl. 102-99.000.

Forbes, Lonnie R., to Fort Enterprises, Limited. Speaker enclosure. 3,938,617, Cl. 181-155.000.

Forch, Hans, to Carl Freudenberg, Firma. Positive-contact seal. 3,938,813, Cl. 277-152.000.

Ford Motor Company: *See—*
Camelon, Melville J.; and Gibeau, Rodney C., 3,939,114.
Glance, Patrick M.; and Maten, Marvin A., Jr., 3,938,841.
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Foster, Robbie T., to PPG Industries, Inc. Laminated asbestos diaphragm. 3,939,055, Cl. 204-295.000.

Foster, Thomas Vincent; and Fenton, Frank Alan, to Emhart Corporation. Control valves. 3,938,777, Cl. 251-82.000.

Fougner, Sven. Production of aluminum trichloride and magnesium oxide. 3,939,247, Cl. 423-135.000.

Foulke, Richard F.: *See—*
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Fowler, Frank C., to Hillyard Chemical Company. Process for producing caprolactam. 3,939,153, Cl. 260-239.30A.

Fowler, Thomas M.; Fraser, Harvey R., Jr.; and Hauke, Francis E., to International Business Machines Corporation. Tape lifter. 3,939,493, Cl. 360-84.000.

Fox, Alan John, to U.S. Philips Corporation. Light modulator. 3,938,878, Cl. 350-150.000.

Fraioli, Joseph, Sr. Pizza pie forming machine. 3,938,926, Cl. 425-233.000.

Frangioni, Alessandro; Venturino, Giovanni; Morandi, Giorgio; and Del Vesco, Adriano, to Montecatini Edison S.p.A. Process for preparing liquid fertilizers. 3,938,982, Cl. 71-34.000.

Frank W. Murphy Manufacturer, Inc.: *See—*
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Franke, Albrecht; and Traber, Walter, to Ciba-Geigy Corporation. Phenoxyphenylalkanoic acid ester insecticides. 3,939,274, Cl. 424-308.000.

Franklin Electric Subsidiaries, Inc.: *See—*
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Franklin Mint Corporation: *See—*
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Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H.: *See—*
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Frazier, Stanley J. Forming panel with connection means for abutting panels. 3,938,776, Cl. 249-114.000.

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French, Walter K., to Seagrave Corporation, The. Method and apparatus for forming tempered glass articles. 3,938,980, Cl. 65-114.000.
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Frisz, James O.; and Price, Harold A., to Watson Industrial Properties. Waste disposal facility and process therefor. 3,938,449, Cl. 110-8.00C.
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Frost, Barry L., to Clark Equipment Company. Clutch mechanism. 3,938,634, Cl. 192-56.00F.
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Fukushima, Juzo. Lure for catching squid and the like. 3,938,275, Cl. 43-42.240.
Fulton, John R., to Extel Corporation. Control system for high speed printer. 3,938,641, Cl. 197-1.00R.
Funatsu, Michiro; and Matsumura, Eiichi, to Hitachi, Ltd.; and Nippon Electric Co., Ltd. Power circuit with shunt transistor. 3,939,399, Cl. 323-22.00T.
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Gall, Kurt. Funnel with automatic air bleeding and valved outlet. 3,938,563, Cl. 141-298.000.
Gallagher, Gregory, Jr.; and Kingsbury, William D., to SmithKline Corporation. 4-Aminothiazole. 3,939,172, Cl. 260-306.80R.
Gallo, Charles F.; and Hammond, Thomas J., to Xerox Corporation. Technique for charging dielectric surfaces to high voltage. 3,939,386, Cl. 317-262.00A.
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Ganz, Robert H. Package transfer unit. 3,938,648, Cl. 198-34.000.
Gardiner, Paul C.; Gardner, Robert S.; Mannal, Clifford; and Payne, John H., to United States of America, Navy. Automatic steering system for a torpedo. 3,938,456, Cl. 114-23.000.
Gardner, John D.; and Manning, John F., to Chevron Research Company. Purification of maleic anhydride. 3,939,183, Cl. 260-346.80M.
Gardner, Larry E.; Grenawalt, John J.; and Birkie, Adolph John, to Youngstown Sheet and Tube Company. Process for producing rimmed enameling steel. 3,939,013, Cl. 148-2.000.
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Garshelis, Ivan J. Mechanical magnets of magnetostrictive, remanent, circularly magnetized material. 3,939,448, Cl. 335-215.000.
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George, William Lloyd; Hays, Robert Guy; and Rhee, Chongkook John, to Motorola, Inc. Vertical channel junction field-effect transistors and method of manufacture. 3,938,241, Cl. 29-571.000.
Gerber, Edward M. Finger splint with traction means. 3,938,510, Cl. 128-85.000.
Gerber Products Company: *See—*
Epperson, Otis A.; and Smith, Raymond H., 3,939,063.
Gersbeck, Rolf: *See—*
Brinkmann, Heinz; Gersbeck, Rolf; and Schlomach, Eckart, 3,938,927.
Getty Oil Company: *See—*
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Ghirga, Marcello: *See—*
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Giammalvo, Nicholas A., to Raymond Lee Organization, Inc., The, a part interest. Combined terrarium and lamp. 3,939,338, Cl. 240-10.00P.
Gibbons, Robert P. Indwelling ureteral catheter. 3,938,529, Cl. 128-349.00R.

Gibeau, Rodney C.: *See—*
Camelon, Melville J.; and Gibeau, Rodney C., 3,939,114.
Gibson, John Philip: *See—*
Chalmers, Brian John; and Gibson, John Philip, 3,939,392.
Giese, Emil; and Maurer, Ruprecht, to Ringspann Albrecht Maurer K.G. Overrunning clutch. 3,938,632, Cl. 192-41.00A.
Gilbert & Barker Manufacturing Company: *See—*
Robinson, George Dennis, Jr.; and Hartsell, Hal Craig, Jr., 3,938,565.
Gilbert, Everett E.: *See—*
Siele, Victor I.; and Gilbert, Everett E., 3,939,148.
Gilbert, Nathan: *See—*
Glasgow, Philip E.; and Gilbert, Nathan, 3,938,960.
Gilbu, Agnar, to Owens-Corning Fiberglas Corporation. Manhole and method of manufacture. 3,938,285, Cl. 52-20.000.
Gilhula, Harry C. Index system. 3,938,268, Cl. 40-23.00A.
Gill, John D. Contra-rotating propeller drive system. 3,938,464, Cl. 115-34.00C.
Gillette Company, The: *See—*
Carbonell, Nelson P.; and Perry, Roger L., 3,938,247.
Perry, Roger L., 3,938,250.
Gilliam, Kenneth D.; and Serres, Carl, to Standard Oil Company. Method of bonding utilizing a heat activated polyamide adhesive. 3,939,029, Cl. 156-331.000.
Gilliland, Barbara Faye; and Henisee, Christine Arentzen, to Scott Paper Company. Prefolded and packaged disposable diaper. 3,938,523, Cl. 128-287.000.
Ginaven, Marvin E., to Bauer Bros. Co., The. Thickening apparatus. 3,939,075, Cl. 210-258.000.
Giorgini, Gerardo; and Bocca, Giorgio, to Eaton Corporation. Aspirated vehicle occupant restraint system. 3,93?,826, Cl. 280-150.0AB.
Givaudan Corporation: *See—*
Bertele, Erhard; and Schudel, Peter, 3,939,206.
Gladwin, Floyd R. Bottle crusher. 3,938,745, Cl. 241-99.000.
Glance, Patrick M.; and Maten, Marvin A., Jr., to Ford Motor Company. Resilient bumper assembly. 3,938,841, Cl. 293-71.00R.
Glasgow, Philip E.; and Gilbert, Nathan, to Pullman Incorporated. External fluid catalytic cracking unit regenerator plenum manifold. 3,938,960, Cl. 23-288.00B.
Glaverbel-Mecaniver: *See—*
Plumat, Emile, 3,938,979.
Glen Raven Mills: *See—*
Maggiolo, Allison, 3,938,955.
Gleyze, Jean, to Societe Civile Textile dite Societex. Device for doffing a full bobbin on a textile machine. 3,938,749, Cl. 242-18.0PW.
Glick, David: *See—*
Gosling, Cyril Henry; Glick, David; Powell, Alan Leslie; and Murray, William Young, 3,939,298.
Glicksman, Martin: *See—*
Clausi, Adolph Scott; Glicksman, Martin; and Farkas, Elizabeth, 3,939,001.
Gliemeroth, Georg, to Jenaer Glaswerk Schott & Gen. Process for producing photochromicity in untreated glasses of suitable composition by a temperature treatment in a liquid. 3,938,977, Cl. 65-30.00R.
Glory Kogyo Kabushiki Kaisha: *See—*
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Goddard, Lloyd E., to Ethyl Corporation. Chemical process. 3,939,215, Cl. 260-624.00A.
Godley, Fred Darroll, to Modular Wall Systems, Inc. Means for forming a prestressed slab including collapsible bulkheads. 3,938,922, Cl. 425-111.000.
Goettel, Richard J.: *See—*
Goettel, Robert J.; Goettel, Richard J.; and Smith, Willis D., 3,938,413.
Goettel, Robert J.; Goettel, Richard J.; and Smith, Willis D. Extrusion preparation apparatus. 3,938,413, Cl. 83-145.000.
Goings, Harford E. Dispenser for collapsible tubes. 3,938,474, Cl. 222-102.000.
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Fierdich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin, a part interest. Articulated toy figure. 3,938,277, Cl. 46-161.000.
Goldschmidt, Alfred; and Stayner, Robert A., to Chevron Research Company. Fire-resistant hydraulic fluid. 3,939,088, Cl. 252-79.0HF.
Golik, Uri: *See—*
Taub, William; and Golik, Uri, 3,939,152.
Gompf, Thomas Edward; and Faul, William Henry, to Eastman Kodak Company. Silver halide color photographic element and process containing leuco dyes. 3,938,995, Cl. 96-55.000.
Gordon, Paul, to Strategic Medical Research Corporation. Novel ethereally monosubstituted monosaccharides. 3,939,145, Cl. 260-210.00R.
Gordon, Paul, to Strategic Medical Research Corporation. Novel ethereal monosubstitutions of monosaccharide derivatives. 3,939,146, Cl. 260-210.00R.
Gordon, Robert A.: *See—*
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Gorelikov, Vladimir Ivanovich: *See—*
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Gosling, Cyril Henry; Glick, David; Powell, Alan Leslie; and Murray, William Young, to British Insulated Callender's Cables Limited. Joints for electric cables. 3,939,298, Cl. 174-21.00R.
Goswami, Jagadish C.: *See—*
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Gottschall Tool & Die, Inc.: *See—*
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Gould Inc.: *See—*
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Goyal, Raghbir C., to Kawneer Company, Inc. Sliding door operator. 3,938,282, Cl. 49-137.000.
Gozzano, Renato; and Martinelli, Santino. Diffused light reflecting screen for taking photos and the like. 3,939,340, Cl. 240-103.00R.
Grandadam, Jean Andre. Novel zootechnical compositions. 3,939,265, Cl. 424-239.000.
Grange, Raymond A., to United States Steel Corporation. In-line heat treatment of hot-rolled rod. 3,939,015, Cl. 148-12.00B.
Granger, Alain; and Sausse, Andre, to Rhone-Poulenc-Textile. Artificial kidney and a method of ultrafiltering a liquid. 3,939,069, Cl. 210-22.00A.
Graves, Ross E., to Hughes Aircraft Company. Phase-locked optical homodyne receiver. 3,939,341, Cl. 250-199.000.
Green, Terence C.; Guion, William G.; Travers, Douglas N.; and Sherrill, William M., to Southwest Research Institute. Quadrupole adcock direction finder and antenna therefor. 3,939,477, Cl. 343-113.00R.
Green, William P.: *See—*
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Greer, Lucian F. Assembly for cleaning overflow passageway in lavatory bowl. 3,938,202, Cl. 4-255.000.
Greis, Ingemar Joel, to Kommanditbolaget United Stirling (Sweden) AB & Co. Sealing means for stirling engine crankcases. 3,938,811, Cl. 277-15.000.
Greive, Aloys, to Hamel G.m.b.H., Zwirnmaschinen. Spinning apparatus for glass-fiber yarn. 3,938,309, Cl. 57-58.860.
Grenawalt, John J.: *See—*
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Gress, Paul William: *See—*
Over, William Roderick; and Gress, Paul William, 3,938,246.
Grey, Jerry. High temperature gas sampling apparatus and method. 3,938,390, Cl. 73-421.50R.
Grgach, Frank J.; and Harris, Everett A., to Branson Ultrasonics Corporation. Ultrasonic welding and cutting apparatus. 3,939,033, Cl. 156-515.000.
Grice, Karl R., to Fiber Controls Corporation. Auto leveler. 3,938,223, Cl. 19-240.000.
Griffith, John Q., III: *See—*
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Williams, Edward S.; Reiland, William H.; and Griffith, John Q., III, 3,939,082.
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Grimes, Homer L. Bucket attachment. 3,938,680, Cl. 214-145.00R.
Grimes, James E.; and Rovan, Joseph W., to Disston, Inc. Power pack with switch for plural primary-secondary connections. 3,939,362, Cl. 307-150.000.
Groenewegen, Paulus Petrus Maria: *See—*
Lohn, Klaus; Lutteke, Georg; Schiefer, Gerd; Bruntink, Lammert; Groenewegen, Paulus Petrus Maria; Weinerth, Hans Viktor; Zwijsen, Wilhelmus Antonius Joseph Marie; and Rooij, Karel Petrus Van, 3,939,429.
Grof, Helmut: *See—*
Schwartz-Domke, Wolfgang; Grof, Helmut; and Wamser, Anton, 3,938,582.
Groginsky, Herbert L., to Raytheon Company. Coded navigation system. 3,939,472, Cl. 340-146.10R.
Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh. Max Grundig: *See—*
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Traub, Karl; and Benecke, Gunther, 3,939,426.
Gschwend, Heinz Werner, to Ciba-Geigy Corporation. Antidepressive and antianxiety composition comprising 2-pyrazolyl-benzophenones. 3,939,271, Cl. 424-273.000.
GSE Inc.: *See—*
Shoberg, Ralph S.; and Ulicny, Thomas A., 3,938,603.
GTE Automatic Electric (Canada) Limited: *See—*
Shaver, David M.; and Gauthier, John A., 3,939,308.
GTE Automatic Electric Laboratories Incorporated: *See—*
Malmgren, William A.; and Gearing, Bryan F., 3,939,309.
Smith, James W., 3,939,311.
GTE Laboratories Incorporated: *See—*
Bridger, Andrew; and Dakss, Mark L., 3,938,895.
GTE Sylvania Incorporated: *See—*
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Dziedzic, Chester J.; Kleiner, Richard N.; and Cleveland, Joseph J., 3,938,923.

Guaranteed Weather, Inc.: *See—*
Clark, Morton L., 3,938,494.
Guerriero, Charles P., to Ford Motor Company. Adjustable tie rod assembly. 3,938,822, Cl. 280-95.00R.
Guest, Jack Bernard; and Guest, Kathleen Ethel Joyce. Document filing apparatus. 3,938,870, Cl. 312-184.000.
Guest, Kathleen Ethel Joyce: *See—*
Guest, Jack Bernard; and Guest, Kathleen Ethel Joyce, 3,938,870.
Guilden, Paul: *See—*
Von Kemenczky, Miklos, 3,938,315.
Guion, William G.: *See—*
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Gukov, Gennady Petrovich: *See—*
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Gulf Oil Corporation: *See—*
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Gulf States Paper Corporation: *See—*
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Gustav Wagner Maschinenfabrik: *See—*
Orendi, Roderich, 3,938,418.
Gypsum Industries Limited: *See—*
Huisman, Peter H., 3,939,067.
Haar, Richard, to Volkswagenwerk Aktiengesellschaft. Resilient shock absorbing bumper. 3,938,795, Cl. 267-140.000.
Haas, Ronald H.; and Wohlscheid, Roy J., to General Motors Corporation. Occupant knee restraint. 3,938,821, Cl. 280-87.00C.
Haas, Werner E. L.; and Adams, James E., to Xerox Corporation. Spherulitic liquid crystalline texture. 3,938,880, Cl. 350-160.0LC.
Haase, Ernst-Gunter; and Konig, Rudolf, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Shock absorber for a vehicle. 3,938,840, Cl. 293-71.00P.
Hafner, John: *See—*
Bobbitt, William C., Jr., 3,938,621.
Hafner, Rudolph: *See—*
Bobbitt, William C., Jr., 3,938,621.
Hagenbach, Robert J., to Xerox Corporation. Highly classified oxidized developer material. 3,939,086, Cl. 252-62.10P.
Hagerman, Lynn W. Shelf retainer for mobile vehicle refrigerators. 3,938,872, Cl. 312-291.000.
Hagio, Akira: *See—*
Nakamura, Takao; Hirose, Itsuo; Misawa, Rokuro; Horii, Hidenori; Hagio, Akira; and Sada, Tetsuo, 3,938,724.
Hahn, Granville J., to Cosden Oil & Chemical Company. Method for blow molding foamed walled plastic open mouthed containers. 3,939,236, Cl. 264-53.000.
Hahnle, Reinhard: *See—*
Meininger, Fritz; and Hahnle, Reinhard, 3,939,141.
Hair, Kirby: *See—*
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Hale, Jesse R. Sandwich core panel having cured face sheets and a core formed with projecting modes. 3,938,963, Cl. 29-191.400.
Hall, Keith L.: *See—*
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Hall, Russell W., Jr.: *See—*
Rundell, Herbert A.; and Hall, Russell W., Jr., 3,938,381.
Hall, William J.; and Myers, Robert A., to Monsanto Company. Lenses for exterior vehicle lamps. 3,939,225, Cl. 260-880.00R.
Hallenbeck, Victor L., to B. F. Goodrich Company, The. Run flat tire and wheel assembly. 3,938,573, Cl. 152-330.0RF.
Halsey, Carl C.: *See—*
Sewell, Robert G. S.; and Halsey, Carl C., 3,938,441.
Hamada Heavy Industries Co., Ltd.: *See—*
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Hammann, Ingeborg: *See—*
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Hammond, Dean C., Jr.; and Quinn, Ronald E., to General Motors Corporation. Premix combustor with flow constricting baffle between combustion and dilution zones. 3,938,324, Cl. 60-39.650.
Hammond, John W. Vehicle with inflatable bumper. 3,938,828, Cl. 280-261.000.
Hammond, Thomas J.: *See—*
Gallo, Charles F.; and Hammond, Thomas J., 3,939,386.
Hansen, Kenneth P.; and Olson, Robert K., to United Technologies Corporation. Method and apparatus for protecting an immersed torque motor against contamination. 3,938,778, Cl. 251-129.000.
Hanson, Richard E.: *See—*
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Harbord, Norman Henry: *See—*
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Hardtle, Wilhelm. Apparatus for debarking logs. 3,938,568, Cl. 144-208.00F.
Hardwick, John H.; Jagoe, William H.; Tonnesen, Carl W.; and Jesse, Harold W., to TME Corporation. Method of making articles such as electrically insulated housings using striped laminates. 3,938,725, Cl. 228-155.000.
Hare, Kenneth H.: *See—*
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Hargest, Thomas S. Syringe filter and valve combination. 3,938,513, Cl. 128-218.00R.
Harman, Eugene V. Automotive hood safety device. 3,938,610, Cl. 180-69.00C.
Harris, Everett A.: *See—*
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Harris-Intertype Corporation: *See—*
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Harris, Raymond W.: *See—*
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Harrison, James Steele: *See—*
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Harsco Corporation: *See—*
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Hartley, Kenneth; and McIntosh, Arthur Edward, to United Kingdom Atomic Energy Authority. Sieves. 3,938,664, Cl. 209-233.000.
Hartline, Albert G., III, to Allegheny Ludlum Industries, Inc. Method of making corrosion resistant austenitic steel. 3,938,990, Cl. 75-122.000.
Hartman, Robert E., to Xerox Corporation. Sheet stacking apparatus. 3,938,802, Cl. 271-220.000.
Hartsell, Hal Craig, Jr.: *See—*
Robinson, George Dennis, Jr.; and Hartsell, Hal Craig, Jr., 3,938,565.
Hashimoto, Yukio: *See—*
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Hasselfors Bruks Aktiebolag: *See—*
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Hastwell, Peter John: *See—*
Smith, Ian Edward; Hastwell, Peter John; and Vermeulen, Marinus Cornelus, 3,939,085.
Hattan, Mark, to Green, William P., a part interest. Formation of fasteners having threads formed of coil structures. 3,938,209, Cl. 10-86.00A.
Hau, Thomas J.; and Cherney, Steven D., to Procter & Gamble Company, The. Combination alkali metal pyrophosphate-alkaline earth metal pyrophosphate detergent builder. 3,939,100, Cl. 252-532.000.
Hauke, Francis E.: *See—*
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Hauptman, Murray L. Automobile chassis jack. 3,938,780, Cl. 254-126.000.
Haussels, Berthold, to Acousa Saxon S.A. Journal rolling bearing. 3,938,864, Cl. 308-187.200.
Havera Development Ltd.: *See—*
Rasmussen, Gunnar Olaf Vestergaard, 3,938,397.
Hawker, Leslie E.: *See—*
Dunleavy, Raymond A.; and Hawker, Leslie E., 3,939,106.
Hawkins, Ronald G., to Aluminum Company of America. Frameless damping spacer with close coil spring. 3,939,300, Cl. 174-42.000.
Hayakawa, Junshiro: *See—*
Uchiyama, Hiroshi; Kakimoto, Kazunobu; Fujiwara, Yoshio; Yamagishi, Shigeru; and Hayakawa, Junshiro, 3,939,079.
Hayashi, Yoshikazu; and Sato, Mitsuo, to Kabushiki Kaisha Tokai Riki Denki Seisakusho. Rotary switch assembly having fixed contacts which may be selectively segmented. 3,939,313, Cl. 200-11.00J.
Hayashi, Yoshimasa: *See—*
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Hayden Trans-Cooler, Inc.: *See—*
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Hayes, John C., to Universal Oil Products Company. Hydrocarbon conversion with a sulfided acidic catalytic composite. 3,939,060, Cl. 208-139.000.
Hayes, John C., to Universal Oil Products Company. Hydrocarbon isomerization catalyst and process. 3,939,102, Cl. 252-439.000.
Hays, Robert Guy: *See—*
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Hays, Wilford R.: *See—*
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Heath, David John: *See—*
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Hechenbleikner, Ingenuin; and Enlow, William Plamer, to Borg-Warner Corporation. Preparation of aliphatic phosphates. 3,939,229, Cl. 260-985.000.
Hechler, Valentine, IV. Continuous flow ratio monitor. 3,938,550, Cl. 137-559.000.
Hecker, Richard; and Butler, Edward A., to United States of America, Navy. Inclined raked partially submerged propellers. 3,938,463, Cl. 115-34.00R.
Heerdt, Ruth: *See—*
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Hegarty, Gerald R.: *See—*
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Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
Wirz, Arno, 3,938,800.
Heighberger, Robert N. Nut with sealing insert. 3,938,571, Cl. 151-7.000.

Hein, Richard D.; Welch, John A.; and Britton, James E., to General Tire & Rubber Company, The. Elastomeric structural bearing. 3,938,852, Cl. 308-3.00R.

Heise, Carl-Hermann. Method and apparatus for manufacturing a coating mass for road constructions. 3,938,785, Cl. 259-149.000.

Helton, Robert A.; Walsh, George M.; and Alarie, Allan P., to Raytheon Company. Remote underwater device activating system. 3,939,465, Cl. 340-5.00R.

Hempenstall, John, to Scenic Flying Limited. Aircraft with improved field of view for passengers. 3,938,761, Cl. 244-13.000.

Henderson, Cyril; and Broughton, John N., to American Safety Equipment Corporation. Child safety seat for vehicles with harness release inaccessible to child passenger. 3,938,859, Cl. 297-385.000.

Henderson, Don J.: *See—*
Johnson, Burnett H.; and Henderson, Don J., 3,939,116.

Henecke, Charles F., to Stewart-Warner Corporation. Bicycle speedometer tire drive gear adaptor assembly. 3,938,395, Cl. 74-12.000.

Henisee, Christine Arentzen: *See—*
Gilliland, Barbara Faye; and Henisee, Christine Arentzen, 3,938,523.

Henkin, Melvyn L. Anesthesia rebreathing apparatus. 3,938,551, Cl. 137-613.000.

Hennrich, Helmut: *See—*
Magidson, Herbert; Huber, Otto L.; and Hennrich, Helmut, 3,939,023.

Hensley, J. Carl: *See—*
Petry, Chester H., Jr.; and Hensley, J. Carl, 3,939,026.

Herbolsheimer, Bruce E.; and Marsh, Douglas D., to Garrett Tubular Products, Inc. Adjustable typewriter platform mechanism. 3,938,766, Cl. 248-23.000.

Herbst, Edward J., to Continental Can Company, Inc. Inclined integral rivet on end panel for tab control. 3,938,696, Cl. 220-273.000.

Herman, Walter H., to Franklin Mint Corporation. Metal covered books. 3,938,831, Cl. 281-29.000.

Hermann Berstorff Maschinenbau GmbH: *See—*
Brinkmann, Heinz; Gersbeck, Rolf; and Schlomach, Eckart, 3,938,927.

Hermstein, Wolfgang; Rosenberger, Gerhard; and Muller, Willi, to Siemens Aktiengesellschaft. Voltage measuring device for an encapsulated high-voltage switching installation. 3,939,412, Cl. 324-96.000.

Hesston Corporation: *See—*
Bennett, Max E.; McCanse, James Edson; Lawson, Gordon L.; and Clark, William H., 3,938,681.

Hickory Springs Manufacturing Company: *See—*
Craig, Charles H., 3,938,857.

Hicks, Glenn W. Faucet. 3,938,556, Cl. 137-636.400.

Higashigawa, Keizo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetor. 3,939,232, Cl. 261-72.00R.

Hill, Lawrence E. Handbag. 3,938,569, Cl. 150-33.000.

Hill, Lawrence M.: *See—*
Fineman, Howard E.; Schlosser, Steven M.; Hill, Lawrence M.; and Hanson, Richard E., 3,938,378.

Hill, Lester M., to Beloit Corporation. Headbox with flexible trailing elements. 3,939,037, Cl. 162-341.000.

Hillyard Chemical Company: *See—*
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Hilti Aktiengesellschaft: *See—*
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Hirai, Shoichi; and Kawata, Kyozo, to Shionogi & Co., Ltd. 3-(2-Methylthio-2-tertiary aminoacetyl)-5-phenylisoxazoles. 3,939,167, Cl. 260-293.670.

Hirokuni, Matono: *See—*
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Hirose, Itsuo: *See—*
Nakamura, Takao; Hirose, Itsuo; Misawa, Rokuro; Horii, Hidenori; Hagio, Akira; and Sada, Tetsuo, 3,938,724.

Hiruma, Mituo, to Nissan Motor Company Limited. Fluid operated vehicle body level control system. 3,938,823, Cl. 280-124.00F.

Hirwe, Asha: *See—*
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HOBEG Hochtemperaturreaktor-Brennelement GmbH: *See—*
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Hodsden, John B.; Middleton, James V.; and James, Edmund W., to Inland Steel Company. Cascade rinsing system and method. 3,938,214, Cl. 15-102.000.

Hodson, Harold Francis; and Batchelor, John Frederick, to Burroughs Wellcome Co. Substituted carbonyl compounds. 3,939,173, Cl. 260-308.00D.

Hodson, Harold Francis; and Batchelor, John Frederick, to Burroughs Wellcome Co. Cyclic carbonyl compounds. 3,939,276, Cl. 424-317.000.

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Hogg, Walter R., to Coulter Electronics, Inc. Particle study device and sample metering means used therein. 3,939,409, Cl. 324-71.0CP.

Hoggatt, John T., to Boeing Company, The. Structural reinforced thermoplastic laminates and method for using such laminates. 3,939,024, Cl. 156-242.000.

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Holbrook, Legrand K.; and Ostler, David S., to Medical Development Corporation. Vacuum-operated fluid bottle for tandem systems. 3,938,540, Cl. 137-205.000.

Holden, Morell J., Jr.; and LeBoutillier, Frank, to Mobil Oil Corporation. Nesting insulated hot-or-cold food tray. 3,938,726, Cl. 229-2.500.

Holden, Robert Stuart. Methods of providing a tube with a thread ring. 3,938,240, Cl. 29-512.000.

Holliday, David H. Continuous operating collator. 3,938,801, Cl. 271-173.000.

Hollyday, Robert David; Bradbery, Jack Leo; and Hudson, William Jeffrey, Jr., to AMP Incorporated. Printed circuit mountable, self grounding, multiple filter module. 3,939,444, Cl. 333-79.000.

Holm, Bengt Lennart; and Edelberg, Gustav Rudolf, to Kockums Mekaniska Verkstads AB. Signalling apparatus for ships. 3,939,385, Cl. 317-157.000.

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Hope, Frederick John Charles; and Pigney, James Malcolm. Method and apparatus for inhibiting vehicle wheel locking. 3,938,849, Cl. 303-21.00A.
Hopkins, David Alan, to Valeron Corporation, The. Center cutting end mill. 3,938,231, Cl. 29-103.00A.
Hopkins, David Alan, to Valeron Corporation, The. Vibration damping assembly. 3,938,626, Cl. 188-1.00B.
Hoppner, Heinzjochen; and Schwarzler, Hans-Jurgen, to Vereinigte Flugtechnische Werke-Fokker GmbH. Aircraft for short landing and takeoff distance. 3,938,760, Cl. 244-12.00D.
Horbach, Alfred; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Process for removing contaminants from polycarbonate solutions. 3,939,118, Cl. 260-47.0XA.
Horie, Ikutaro: *See—*
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Horn, Barry N.; Swain, Richard S.; and Rice, Richard C., to Horn, Barry N. Security alarm system. 3,939,460, Cl. 340-408.000.
Horn, Curtis L., to Hycalog, Inc. Rotary drill bit. 3,938,599, Cl. 175-329.000.
Hornyak, John; and Stahl, Howard D., to General Foods Corporation. Dry carbonation source for a beverage concentrate and method of preparing the same. 3,939,289, Cl. 426-548.000.
Horwath, Tibor G., to United States of America, Navy. Distributed temperature sensor. 3,938,385, Cl. 73-342.000.
Horwath, Tibor G., to United States of America, Navy. Spatially distributed transducer for towed line array applications. 3,939,466, Cl. 340-7.00R.
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Hugelin, Bernard; and Troxler, Eduard, to Ciba-Geigy Corporation. Novel 1,2-diaza-1,5,9-cyclo dodecatrienes and 1,2-diaza-1-cyclododecenes. 3,939,147, Cl. 260-239.0BC.
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Hughes, James A. Trackway for overhead transportation system. 3,938,445, Cl. 104-124.000.
Huisman, Peter H., to Gypsum Industries Limited. Method and apparatus for treating sewage. 3,939,067, Cl. 210-7.000.
Humber, Leslie G.: *See—*
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Hummel, Merritt J., to PPG Industries, Inc. Method of making crystallized glass. 3,938,978, Cl. 65-33.000.
Humphrey, John H., to Data Source Corporation. Optical reading apparatus and method. 3,939,327, Cl. 235-61.11E.
Hunter, Edwin J., to Toro Company, The. Water powered drive for automatic controllers. 3,938,426, Cl. 92-140.000.
Husbands, Kelly. Net and portable net roller. 3,938,806, Cl. 273-95.00R.
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Hwa, Jesse C. H.; Kraft, Paul; and Feiler, Leonard, to Stauffer Chemical Company. Cofused resins and their preparation. 3,939,135, Cl. 260-87.100.
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Zambolin, Adriano; and Defalco, Gianfranco, 3,938,644.
Ingerstedt, Sven Ake; and Lantz, Arne Nils, to Hasselfors Bruks Aktiebolag. Germination and seedling promoting assembly. 3,938,281, Cl. 47-37.000.
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Isenberg, Gerhard; Bloch, Peter; and Tuzinsky, Wolfgang, to Maschinenfabrik Augsburg-Nurnberg Aktiengeselischaft. Flow machine for an aggressive, radioactive or special-purity flow medium. 3,938,913, Cl. 417-356.000.
Ishimaru, Kenzo: *See*—
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Jackson, W. Shaun; and Bohm, Leslie Eric. Convertible back-pack pannier. 3,938,716, Cl. 224-9.000.
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James, Wilbur G., to United States of America, Navy. Instantaneous frequency measurement system. 3,939,411, Cl. 324-77.00H.
Jamshidi, Khosrow. Soft tissue biopsy aspirating device. 3,938,505, Cl. 128-2.00B.
Janes, George Sargent, to Jersey Nuclear-Avco Isotopes, Inc. Method and apparatus for separation of ions from a plasma. 3,939,354, Cl. 250-484.000.
Jansen, Helmut; and Vollmer, Klaus, to Robert Bosch G.m.b.H. Apparatus for sealing containers. 3,938,305, Cl. 53-300.000.
Janssen, Lutz, to Volkswagenwerk Aktiengesellschaft. Water collecting device associated with the side window of a vehicle. 3,938,856, Cl. 296-154.000.
Jaronko, John C.; and Jaronko, John T., to Nutmeg Sanitation Inc. Mobile furnace vehicle. 3,938,450, Cl. 110-8.00C.
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Jelks, James W. Process for oxidizing and hydrolyzing plant organic matter particles to increase the digestability thereof by ruminants. 3,939,286, Cl. 426-312.000.
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Johnson, Burnett H.; and Henderson, Don J., to Exxon Research and Engineering Company. Self-supported, oriented high-performance films having minimal thermal distortion properties. 3,939,116, Cl. 260-47.0CB.
Johnson, Charles L. Bicycle interconnecting apparatus. 3,938,827, Cl. 280-209.000.
Johnson, Curtiss S., Jr., to C. Sherman Johnson Co., Inc. Adjustable pelican hook. 3,938,844, Cl. 294-83.00R.
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Jonelis, Robert E.; Christoph, Dieter; and Schulz, Siegfried, to Midwest Power Corporation. Pipe and tube end preparation apparatus. 3,938,411, Cl. 82-4.00C.
Jones, Allen Paul, Jr.; Knopf, Robert John; and Conner, Claude Milton, to Union Carbide Corporation. Microporous polyurethane hydrogels, method and composites with natural and other synthetic fibers or films. 3,939,105, Cl. 260-2.5AY.
Jones, Francis J. Toothpick dispenser. 3,938,701, Cl. 221-184.000.
Jones, Kendall, to Kaiser Aerospace and Electronics Corporation. Quick-release fuel coupling for racing cars. 3,938,564, Cl. 141-352.000.
Jones, Leon. Pressure regulator. 3,938,547, Cl. 137-488.000.
Jones, Richard William. Apparatus for forming a plurality of bales into a stack of predetermined size. 3,938,432, Cl. 100-7.000.
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Jurd, Leonard, to United States of America, Agriculture. 3,4-Methylenedioxy-cinnamyloxybenzene as a mosquito larvicide. 3,939,273, Cl. 424-282.000.
Jurgens, Rainer; and Ostertag, Alfred, to Christensen Diamond Products Company. Shrink-fit sleeve apparatus for drill strings. 3,938,853, Cl. 308-4.00A.
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Kaiser, Carl; and Pendleton, Robert G., to SmithKline Corporation. 7 and 8-Halo substituted 1,2,3,4-tetrahydroisoquinoline compounds. 3,939,164, Cl. 260-286.00R.
Kajima Corporation: *See*—
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Kalko, Jurgen; and Crull, Wolfgang, to Lucca GmbH. Method of preparing liquid mixtures of predetermined composition. 3,938,537, Cl. 137-14.000.
Kamijima, Kiyokazu: *See*—
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Kampf, William M.; and Law, Denny B., to Aquappliances, Inc. Fireplace forced air circulation means. 3,938,496, Cl. 126-121.000.
Kane, William Paul, to Du Pont de Nemours, E. I., and Company. Method of making a polyethylene terephthalate laminate. 3,939,025, Cl. 156-244.000.
Kanno, Susumu: *See*—
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Kareman, James, to Raymond Lee Organization, Inc., The, a part interest. Saber or jig saw with demountable foot plate and shield. 3,938,251, Cl. 30-376.000.

Karl M. Reich Maschinenfabrik: *See*—
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Karlsson, Einar. Hydraulic load sensing device. 3,938,380, Cl. 73-141.00R.

Karnemaat, John N., to General Environmental Systems Co., Inc. Process for treating animal waste. 3,939,280, Cl. 426-2.000.

Karpov, Vladimir Alexeevich: *See*—
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Kashiwagi, Teruya: *See*—
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Katsumata, Ryoichi: *See*—
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Katzakian, Arthur, Jr.; and DePree, David O., to Aerojet-General Corporation. Recoverable regenerants for cationic exchange resins. 3,939,071, Cl. 210-34.000.

Kauffman, Joel M., to New England Nuclear Corporation. Compositions and process for liquid scintillation counting. 3,939,094, Cl. 252-301.20C.

Kaupp, Robert F., to Selas Corporation of America. Tube support. 3,938,476, Cl. 122-510.000.

Kavesh, Sheldon, to Allied Chemical Corporation. Apparatus for production of continuous metal filaments. 3,938,583, Cl. 164-276.000.

Kawada, Kimihiro: *See*—
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Kawakami, Heijiro; Kawaguchi, Yasunobu; and Fukinbara, Hazime. Device for continuously treating wires. 3,938,751, Cl. 242-47.010.

Kawamoto, Isao: *See*—
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Kawano, Takatsugu; Kojima, Hiroshige; Ohosawa, Hiroshi; and Morinaga, Kazuto, to Asahi Kasei Kogyo Kabushiki Kaisha. Feed and method of aquianimals cultivation. 3,939,279, Cl. 426-2.000.

Kawara, Masaru: *See*—
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Kawasaki, Kentaro; and Takizawa, Keizo, to Chori Company Limited. Method of producing deeply creped fabric with partially bulked yarn. 3,938,227, Cl. 28-72.0FT.

Kawasaki, Takato; and Ikuta, Yuko, to Takenaka Komuten Company, Ltd. Process for reinforced concrete wall forming. 3,938,292, Cl. 52-742.000.

Kawashima, Norifumi; Kamijima, Kiyokazu; and Yakeuchi, Yoshiaki, to Sony Corporation. Recording and reproducing apparatus. 3,939,489, Cl. 360-13.000.

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Keech, Eugene Elwin, to Electronic Engineering Co. of California. Previous events memory. 3,939,333, Cl. 235-153.0AP.

Keith, James A., Jr., to Singer Company, The. Dust bag support. 3,938,283, Cl. 51-170.00R.

Kella, Harry Y., to Raymond Lee Organization, Inc., The, a part interest. Hand and arm strength measuring device. 3,938,389, Cl. 73-381.000.

Keller, Albert G.: *See*—
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Keller, Hans, to ITT Industries, Inc. Reverberation device. 3,939,436, Cl. 330-84.000.

Keller, Wolfgang, to Siemens Aktiengesellschaft. Method of producing monocrystalline semiconductor material, particularly silicon, with adjustable dislocation density. 3,939,035, Cl. 156-618.000.

Kellogg, Walter J., to Westinghouse Electric Corporation. Indicator lamp circuit having feedback protection. 3,939,398, Cl. 324-21.000.

Kelly, George B., Jr., to United States of America, Congress. Composition for use in deacidification of paper. 3,939,091, Cl. 252-189.000.

Kelly, James E.; Foulke, Richard F.; and Fitzsimmons, Raymond T., to Mech-El Industries, Inc. Ultrasonic thermal compression beam lead, flip chip bonder. 3,938,722, Cl. 228-1.000.

Kelly, Neil C.; McFarland, Robert L.; and Sampsell, Jack W., to United States of America, Navy. Acoustic transponder navigation system. 3,939,463, Cl. 340-3.00E.

Kelsey-Hayes Company: *See*—
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Kemkers, Pieter; and Derks, Antonius Lambertus, to U.S. Philips Corporation. Method of making a capacitor housing. 3,938,228, Cl. 29-25.420.

Kenki Kagaku Kogyo Kasushiki Kaisha: *See*—
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Kern, Ruy E. Cargo transport system. 3,938,678, Cl. 214-38.00D.

Kershaw, Eli J. Air filter. 3,938,973, Cl. 55-501.000.

Kershaw, Samuel L.; and Proeschl, Bernard E., to Caterpillar Tractor Co. Method for making a modular truck body. 3,938,238, Cl. 29-469.000.

Khanna, Ravi: *See*—
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Kihara, Nobutoshi, to Sony Corporation. Method and apparatus for recording and/or reproducing a video signal on a photographic record disc. 3,939,302, Cl. 178-6.60R.

Kim, Keun Y., to Monsanto Company. Dentifrices. 3,939,262, Cl. 424-52.000.

Kimball, James F. Electrical plug mounting device for power tools. 3,938,873, Cl. 339-58.000.

Kimmel, David R.: *See*—
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Kinney, Alfred W., to Phillips Petroleum Company. Magazine feeder for circular elements. 3,938,697, Cl. 221-11.000.

Kirsch, Ulrich; and Buhler, Wolfgang, to Intermedicat GmbH. Device for measuring sedimentation rates. 3,938,370, Cl. 73-61.400.

Kirschner, James B., to Wheeling-Pittsburgh Steel Corporation. Apparatus for wiping liquid from a strip. 3,938,468, Cl. 118-63.000.

Kitamura, Seiichi: *See*—
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Klees, Garry W., to Boeing Company, The. Multicycle engine. 3,938,328, Cl. 60-262.000.

Kleiner, Hans-Jerg; and Rosinger, Sigurd, to Hoechst Aktiengesellschaft. Process for the preparation of ethane-1,2-diphosphinic acid diesters. 3,939,050, Cl. 204-162.0HE.

Kleiner, Richard N.: *See*—
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Klepikova, Alla Nikolaevna: *See*—
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Klingler, Josef F., to Thermex, Inc. Thermometer. 3,938,388, Cl. 73-371.000.

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Klotzer, Erhard: *See*—
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Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; Savard, Guy; and Lee, Robert, to Eisenwerk-Gesellschaft Maximilianshutte mbH. Method and converter for refining pig-iron into steel. 3,938,790, Cl. 266-35.000.

Kobata, Mamoru: *See*—
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Kobayashi, Yukitsugu: *See*—
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Kobzina, John W., to Chevron Research Company. Substituted triazines. 3,938,985, Cl. 71-93.000.

Koch, Stanislaus H., to Clark Equipment Company. Track suspension. 3,938,605, Cl. 180-9.500.

Kockums Mekaniska Verkstads AB: *See*—
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Koenig, Horst; Metzger, Horst; and Reif, Werner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of carbonyl compounds substituted in α-position. 3,939,184, Cl. 260-349.000.

Koenig, Richard D.: *See*—
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Koizumi, Mokuji; Kobayashi, Yukitsugu; Tsukamoto, Hidehiko; and Maeda, Nobutaka, to Mitsubishi Jukogyo Kabushiki Kaisha. Process and apparatus for rolling forming a cylindrical member having a reduced diameter portion at its intermediate portion. 3,938,375, Cl. 72-108.000.

Kojima, Hiroshige: *See*—
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Koleshikova, Nina Ivanovna: *See*—
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Kommanditbolaget United Stirling (Sweden) AB & Co.: *See*—
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Komura, Ikuo; Tamai, Hideo; Morita, Takayuki; and Kobayakawa, Masanao, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and device for transferring fresh bobbins from a bobbin supply device to a conveyer belt of a textile machine. 3,938,308, Cl. 57-52.000.

Konarski, Raymond M.: *See*—
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Kondo, Shinichi: *See*—
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Konig, Hans-Bodo; Schrock, Wilfried; Disselnkotter, Hans; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Ureidoacetamidopenicillins. 3,939,149, Cl. 260-239.100.

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Konishiroku Photo Industry Co. Ltd.: *See*—
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Konstant, Anthony N., to Speedrack Inc. Guiderail system for storage racks. 3,938,668, Cl. 211-134.000.

Konstantinov, Vladimir Ivanovich: *See*—
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Konyha, Peter P., to Allis-Chalmers Corporation. Single lever forward-reverse control. 3,938,400, Cl. 74-242.10R.

Koppang, Ronald N. Air vents. 3,938,430, Cl. 98-103.000.

Koppers Company, Inc.: *See*—
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Kroeze, Hendrik J.; and Scheij, Hans, 3,938,674.
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Kozawa, Akiya, to Union Carbide Corporation. Hydrogen absorbing material for electrochemical cells. 3,939,006, Cl. 136-6.0GC.

Kozul, Theodore L.; and Crandell, Paul A. Millimeter wave translating device with changeable insert element. 3,939,446, Cl. 333-98.00R.

Kraft, Paul: *See*—
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Krambrock, Wolfgang; Lubbehusen, Paul; and Huck, Hans-Jurgen, to Waeschle Maschinenfabrik GmbH. Methods and apparatus for the pneumatic conveying of material. 3,938,848, Cl. 302-42.000.

Krampe, Josef. Stripping tool for a cable having cover made of a synthetic material. 3,938,248, Cl. 30-90.400.

Kravtsov, Alexandr Feodosievich: *See*—
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Krier, Keith N.; Brown, Neil F.; and Waldhauser, Steven J. A., to Tennant Company. Scrubbing machine. 3,938,212, Cl. 15-50.00C.

Kriger, Jury Nikolaevich: *See*—
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Kroeze, Hendrik J.; and Scheij, Hans, to Koppers Company, Inc. Method and apparatus for stacking paperboard blanks. 3,938,674, Cl. 214-6.00G.

Kroffke, Kenneth K., to Houdaille Industries, Inc. Pump stroke adjustment device. 3,938,425, Cl. 92-60.500.

Krolak, Leo V.: *See*—
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Kronick, Melvyn N.; and Little, William A., to Board of Trustees of the Leland Stanford Junior University. Fluorescent immunoassay employing total reflection for activation. 3,939,350, Cl. 250-365.000.

Krylova, Irina Fedorovna: *See*—
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Koleshikova, Nina Ivanovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,938,951.

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Kugler, Artur; and Zaunberger, Franz Xaver, to Zahnraderfabrik Renk Aktiengesellschaft. System for steering and driving a full-track vehicle. 3,938,604, Cl. 180-6.440.

Kuhle, Engelbert; Klauke, Erich; Kaspers, Helmut; and Scheinppflug, to Bayer Aktiengesellschaft. N-fluorodichl oromethylthio)-n-(trifluoromethyl)-aminobenzhydroxamic acids salts. 3,939,189, Cl. 260-429.900.

Kuhle, Engelbert; Siegle, Peter; Hammann, Ingeborg; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. N-sulfenylate-N-methylcarbamic acid esters of 2-oximino-alkanecarboxylic acid nitriles. 3,939,192, Cl. 260-453.00R.

Kuhn, Norbert: *See*—
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Kuntze, Rudolf, to Siemens Aktiengesellschaft. Method for the tabulator-like illustration of symbols. 3,939,458, Cl. 340-324.00A.

Kuo, Chan-Hwa; Taub, David; and Wendler, Norman L., to Merck & Co., Inc. Prostaglandin E_1 intermediate 6α-carboxy-5α(1-hydroxyethyl)-2-cyclohexene-1-heptanoic acid,γ-lactone, and lower alkyl or aralkyl esters thereof. 3,939,182, Cl. 260-343.30R.

Kurabayashi, Kinji; and Ono, Tatsuo, to Nisso-Sangyo Co. Ltd. Stanchion. 3,938,619, Cl. 182-113.000.

Kuramoto, Yoshio; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Self-processing camera. 3,939,483, Cl. 354-83.000.

Kurata, Tokuzo; Okano, Takeshi; Ohfuchi, Kunihiko; Tamaru, Akio; Murata, Yoshifumi; and Nagashima, Saburo, to Mitsubishi Chemical Industries Ltd. Process for hydrating an unsaturated nitrile. 3,939,205, Cl. 260-561.00N.

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Kurer Research & Development: *See—*
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Nakayama, Kiyoshi; Kobata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, 3,939,042.

Labana, Santokh S.; and Theodore, Ares N., to Ford Motor Company. Powder paint with epoxy and amide copolymer and mixture of dicarboxylic acids and polyanhydrides. 3,939,127, Cl. 260-78.40D.

Lacan, Guy; and Oehlert, Yves, to Le Telemecanique Electrique. Chassis intended to hold electronic circuits. 3,939,382, Cl. 317-101.0DH.

Lacefield, William B.; and Marshall, Winston S., to Eli Lilly and Company. Phenoxyphenyl-acetylenes and thio analogues thereof as antithrombotic agents. 3,939,278, Cl. 424-340.000.

Lachnit-Fixson, Ursula, to Schering Aktiengesellschaft. Method for contraception by the administration of sequential contraceptive preparations. 3,939,264, Cl. 424-239.000.

Lacon, John W., to Fiberglas Canada Limited. Method of forming articles of fibrous materials. 3,939,022, Cl. 156-200.000.

Lafon, Victor, to Societe Anonyme dite: Orsymonde. Therapeutic and cosmetic compositions. 3,939,260, Cl. 424-28.000.

LaForte, Eric Jourdan, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Apparatus for generating an oxidizing reagent for the treatment of polluted water. 3,939,072, Cl. 210-96.00R.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
LaForte, Eric Jourdan, 3,939,072.

Lambrecht, Jurgen: *See—*
Huf, Franz; and Lambrecht, Jurgen, 3,938,919.

Lamport, Daphne Louise: *See—*
Schagen, Pieter; King, Hewson Nicholas Graham; Lamport, Daphne Louise; Pook, Roger; Stubberfield, Pamela May; and Washington, Derek, 3,939,374.

Lamy, Jacques Edouard, to C. G. Doris. Platform structure for maritime installation. 3,938,343, Cl. 61-46.500.

Lane, Oscar B. Tow bar assembly. 3,938,830, Cl. 280-493.000.

Lanier, Terry O.; and Martha, Eugene F., to Corning Glass Works. Applicator card. 3,938,957, Cl. 23-259.000.

Lanier, Terry O.; and Martha, Eugene F., to Corning Glass Works. Fluid dispensing device. 3,938,958, Cl. 23-259.000.

Lanier, Terry O., to Corning Glass Works. Sample tray. 3,938,961, Cl. 23-292.000.

Lantz, Arne Nils: *See—*
Ingerstedt, Sven Ake; and Lantz, Arne Nils, 3,938,281.

LaPointe Machine Tool Company, The: *See—*
Yuryan, Joseph B., 3,938,846.

Larrabee, Robert Dean, to RCA Corporation. Suspension for depositing a pyroelectric material. 3,939,098, Cl. 252-518.000.

Larsen, Rex Stemann: *See—*
Nygaard, Sven; and Larsen, Rex Stemann, 3,938,887.

Larson, Raymond E., to ECC Corporation. Shunt A.C. voltage regulator with modified full-wave bridge. 3,939,396, Cl. 323-8.000.

Lartigue, Donald J.; and Weetall, Howard H., to Corning Glass Works. Method of making fructuose. 3,939,041, Cl. 195-31.00F.

Lauritsen, William Eger Nyboe. Apparatus for the mechanical operation of thread or yarn guides. 3,938,560, Cl. 139-59.000.

Lauro, Luciano: *See—*
Pomella, Piero; and Lauro, Luciano, 3,939,390.

Lauterbach, William L., to United States Steel Corporation. Expansion shim for hot briquette roll segments. 3,938,930, Cl. 425-472.000.

Lauth, Corliss, to Lauth Fasteners Limited. Method of forming a self-flanging nut joint. 3,938,239, Cl. 29-512.000.

Lauth Fasteners Limited: *See—*
Lauth, Corliss, 3,938,239.

Laven, Merrill L. Swimming pool components. 3,938,199, Cl. 4-172.190.

Law, Denny B.: *See—*
Kampf, William M.; and Law, Denny B., 3,938,496.

Lawrie, Robert James: *See—*
Barnes, Stanley Charles; and Lawrie, Robert James, 3,939,009.

Lawson, Gordon L.: *See—*
Bennett, Max E.; McCanse, James Edson; Lawson, Gordon L.; and Clark, William H., 3,938,681.

Lawson, John E.; Dennis, Ronnie D.; and Majewski, Robert F., to Mead Johnson & Company. Diarylcyclobutanes. 3,939,196, Cl. 260-613.00R.

Le Telemecanique Electrique: *See—*
Lacan, Guy; and Oehlert, Yves, 3,939,382.

LeBoutillier, Frank: *See—*
Holden, Morell J., Jr.; and LeBoutillier, Frank, 3,938,726.

Lee, Poy. Double action winter road conditioner apparatus. 3,938,835, Cl. 291-34.000.

Lee, Robert: *See—*
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; Savard, Guy; and Lee, Robert, 3,938,790.

Lee, Wei-Kuo: *See—*
Metzner, Arthur B.; Vaseleski, Raymond C.; and Lee, Wei-Kuo, 3,938,536.

Lee, Yuan Ho. Knockout mechanism for a high-speed automatic cold heading machine. 3,938,208, Cl. 10-11.00E.

Leeds & Northrup Company: *See—*
Hoopes, Howard S., 3,939,459.

Leeper, Harold M.; and Michaels, Alan S., to Alza Corporation. Novel drug permeable wall. 3,938,515, Cl. 128-260.000.

Lees, Robert, to Allied Chemical Corporation. Spin pack assembly. 3,938,925, Cl. 425-198.000.

Leesona Corporation: *See—*
Barnes, Porter I.; and Steele, Carlton A., 3,938,750.

Lehman, Ivan L., to Damon Corporation. Apparatus for transmitting rotational energy from a motor to the rotor of a centrifuge. 3,938,354, Cl. 64-1.00V.

Lehmann, Hans-Gunter, to Schering Aktiengesellschaft. 15α,-Sulfonyloxy-12β-hydroxypregnanes and process for the preparation thereof. 3,939,187, Cl. 260-397.450.

Lehnert, Guenther: *See—*
Zimmermann, Manfred; Lehnert, Guenther; Maertens, Dieter; and Pampus, Gottfried, 3,939,136.

Leib, Joseph. Cleaning machine utilizing non-liquid cleaning agents. 3,938,357, Cl. 69-23.000.

Leichter, Peter: *See—*
Bildstein, Hubert; Knotik, Karl; and Leichter, Peter, 3,939,233.

Leifheit, Guenter, to Leifheit International Gunter Leifheit GmbH. Method of manufacturing brushing apparatus. 3,938,236, Cl. 29-434.000.

Leifheit International Gunter Leifheit GmbH: *See—*
Leifheit, Guenter, 3,938,236.

Leiponen, Matti Olavi; and Kivisto, Tuomo Veikko Juhani, to Outokumpu OY. Device for transferring a plate-like product from one station to another. 3,938,672, Cl. 214-1.0BD.

Leland Stanford Junior University, The Board of Trustees of: *See—*
Simmons, F. Blair, 3,938,500.

Leopard, George W.; and Hair, Kirby. Passive ranging tail warning device. 3,939,476, Cl. 343-112.00R.

L'Eplattenier, Francois; Pugin, Andre; and Vuitel, Laurent, to Ciba-Geigy Corporation. Bis-2-azomethine pigments, process for their manufacture and their use. 3,939,194, Cl. 260-439.00R.

Lerner, Bernard, to Automated Packaging Systems, Inc. Packaging system and method. 3,938,299, Cl. 53-22.00B.

Leventer, William. Color video signal generators. 3,939,487, Cl. 358-81.00.

Lever Brothers Company: *See—*
Carlile, Norman John; and van Selm, Theodorus Johannes, 3,939,282.
Detzel, Josef; and Bartels, Klaus Peter, 3,938,730.

Levy, Jerome F.: *See—*
Emmons, William D.; and Levy, Jerome F., 3,939,200.

Lewalter, Jurgen: *See—*
Merten, Rudolf; Lewalter, Jurgen; and Zecher, Wilfried, 3,939,122.

Lewey, Ernest L.; Sharpe, Ned K.; and Sloan, James F., to Burlington Industries, Inc. Method and apparatus for handling large fabric rolls for slitting. 3,938,671, Cl. 214-1.00R.

Lewis, Bernard L., to United States of America, Navy. Method of measuring range with large bistatic angle radar. 3,939,475, Cl. 343-12.00R.

Lewis, Bernard L., to United States of America, Navy. Level and cross-level stabilization technique for search radar antennas. 3,939,480, Cl. 343-761.000.

Leybold Heraeus GmbH & Co. KG: *See—*
Schwartz-Domke, Wolfgang; Grof, Helmut; and Wamser, Anton, 3,938,582.

Libbey-Owens-Ford Company: *See—*
Moehring, Richard J., 3,938,660.

Lichte, Henry P., Jr., to Geolograph Industries. Cantilever-type inclinometer. 3,938,255, Cl. 33-311.000.

Liguori, Mario, to Messrs Elettronica Aster S.r.l. Ball universal joint for wave guides. 3,939,445, Cl. 333-98.0TN.

Lillig, Floyd A.: *See—*
Schrimper, Vernon L.; Lillig, Floyd A.; and Ulch, Darrell J., 3,938,732.

Linard, Robert, to Societe Anonyme dite: SETIM Societe d'Etudes Techniques des Industries Metallurgiques. Patient-lifter. 3,938,203, Cl. 5-81.00R.

Linde Aktiengesellschaft: *See—*
Winkler, Dietmar, 3,938,391.

Lindgren, Alf: *See—*
Risberg, Sture; Lindgren, Alf; Rixon, Kjell; Wallden, Rickard; and Brundin, Bengt, 3,939,420.

Lindgren, William A. Pulse peak detector. 3,939,365, Cl. 307-235.00A.

Lindner, Herbert G., to United States of America, Army. Security remote control method and system. 3,939,419, Cl. 325-33.000.

Lipe-Rollway Corporation: *See—*
Nerska, Karl, 3,938,636.

Lippman, Alfred: *See—*
Sebenik, Roger Frank; and Lippman, Alfred, 3,938,969.

Litovitz, Theodore A.: *See—*
Macedo, Pedro B.; and Litovitz, Theodore A., 3,938,974.

Little, William A.: *See—*
Kronick, Melvyn N.; and Little, William A., 3,939,350.

Littlejohn, David G.: *See—*
Wethington, Charles A.; and Littlejohn, David G., 3,939,030.

Llewellyn, Rees Jenkin: *See—*
Raw, Peter Michael; and Llewellyn, Rees Jenkin, 3,939,299.

Loane, Edward S., to General Public Utilities Corporation. Hydro-air storage electrical generation system. 3,939,356, Cl. 290-52.000.

Lockheed Aircraft Corporation: *See—*
Bertrand, Isidore L. Q.; and Hays, Wilford R., 3,939,321.

Loeser, John K., to Positive Safety Manufacturing Company, The. Safety device for power-operated presses and the like. 3,939,314, Cl. 200-61.420.

Lohn, Klaus; Lutteke, Georg; Schiefer, Gerd; Bruntink, Lammert; Groenewegen, Paulus Petrus Maria; Weinerth, Hans Viktor; Zwijsen, Wilhelmus Antonius Joseph Marie; and Rooij, Karel Petrus Van, to U.S. Philips Corporation. Tunable high frequency input circuit for a television receiver that tunes both VHF and UHF channels and can be readily integrated. 3,939,429, Cl. 325-432.000.

Longo, John M.; and Clavenna, LeRoy R., to Exxon Research and Engineering Company. Use of perovskites and perovskite-related compounds as battery cathodes. 3,939,008, Cl. 136-6.0LN.

Loomba, Yogendra Singh: *See—*
Stephenson, Robert L.; and Loomba, Yogendra Singh, 3,938,754.
Stephenson, Robert L.; Pfeiffer, Robert C.; and Loomba, Yogendra Singh, 3,938,755.

Lopke, Edward L.: *See—*
Davis, James L.; Lopke, Edward L.; and Huellmantel, Louis W., 3,938,321.

Lorch, Leonard G. Illuminated mobile construction. 3,939,478, Cl. 343-721.000.

Lorenc, Tadeusz: *See—*
Marszalek, Leszek; Lorenc, Tadeusz; and Hodbod, Andrzej, 3,938,629.

Lorkin, Clive Graham: *See—*
Schiffarth, Josef; Lorkin, Clive Graham; and Fletcher, Kenneth John, 3,939,028.

Loshbough, Richard C.: *See—*
Williams, Roger B., Jr.; and Loshbough, Richard C., 3,939,332.

Lovendusky, Charles Michael; and Wallick, Charles William, to Du Pont de Nemours, E. I., and Company. Terminal applicator. 3,938,245, Cl. 29-626.000.

Lovqvist, Karl Bo Lennart. Arrangement in refuse chutes. 3,938,300, Cl. 53-124.00E.

Lubbehusen, Paul: *See—*
Krambrock, Wolfgang; Lubbehusen, Paul; and Huck, Hans-Jurgen, 3,938,848.

Lucas, Theodore W., Jr., to Andco Incorporated. Gasifier charging system. 3,938,451, Cl. 110-109.000.

Lucca GmbH: *See—*
Kalko, Jurgen; and Crull, Wolfgang, 3,938,537.

Lucking, Hans Joachim; Seyfried, Klaus; Buchner, Werner; and Rudolph, Karl-Heinz, to Bayer Aktiengesellschaft. Preparation of silanol containing organopolysiloxanes. 3,939,195, Cl. 260-448.20E.

Luhman, Robert A.; and Ward, John R., to Minnesota Mining and Manufacturing Company. System for inflation and sealing of air cushions. 3,938,298, Cl. 53-7.000.

Lummus Company, The: *See—*
O'Sullivan, Thomas F.; and Knol, Henricus J., 3,938,475.
Sze, Morgan C.; and Wang, Ruey H., 3,939,209.

Lundberg, Robert D.; and Makowski, Henry S., to Exxon Research and Engineering Company. Fabrication process for multiphased plastics. 3,939,242, Cl. 264-294.000.

Lussow, Robert O.: *See—*
Brusic, Vlasta; and Lussow, Robert O., 3,939,293.

Luthi, Hanspeter; and Dubach, Werner. Ball game with shiftable labyrinthine platform. 3,938,807, Cl. 273-110.000.

Lutteke, Georg: *See—*
Lohn, Klaus; Lutteke, Georg; Schiefer, Gerd; Bruntink, Lammert; Groenewegen, Paulus Petrus Maria; Weinerth, Hans Viktor; Zwijsen, Wilhelmus Antonius Joseph Marie; and Rooij, Karel Petrus Van, 3,939,429.

Luzzi, John J.: *See—*
Ramey, Chester E.; and Luzzi, John J., 3,939,163.

Lyons, John H. Signal device. 3,938,465, Cl. 116-63.00P.

M.E.D.S. Corporation: *See—*
Ritota, Michael C.; and Mancini, L. Phillip, 3,938,521.

Maas, Dieter: *See—*
Winkler, Alfred; Engelsmann, Dieter; Maas, Dieter; and Schroder, Rolf, 3,939,484.

MacAskill, Robert Bruce, Jr.; and Porter, Charles Norvin, to Sundstrand Corporation. Burner control system with secondary safety switch. 3,938,939, Cl. 431-79.000.

Macedo, Pedro B.; and Litovitz, Theodore A. Method of producing optical wave guide fibers. 3,938,974, Cl. 65-3.00R.

Mack, Robert F.: *See—*
Stavropoulos, William S.; Thiegs, Bernard J.; and Mack, Robert F., 3,938,954.

Macke, Thomas F., to Hydrabind, Inc. Signature arranging device and method. 3,938,799, Cl. 270-55.000.

Madelaine, Serge: *See—*
Belliot, Christian; Cheylan, Etienne; Madelaine, Serge; and Ebbing, Johannes, 3,939,103.

Madison, George Benjamin, to Coleman Company, Inc., The. Backpack frame and assembly. 3,938,718, Cl. 224-25.00A.

Madison, Richard Keith: *See—*
Spector, Richard Harvey; and Madison, Richard Keith, 3,939,211.

Madland, Thorvald: *See—*
Seitz, Robert F.; Fritz, William E.; and Madland, Thorvald, 3,938,446.

Maeda, Kenji: *See—*
Umezawa, Hamao; Maeda, Kenji; Kondo, Shinichi; and Umezawa, Sumio, 3,939,143.

Maeda, Nobutaka: *See—*
Koizumi, Mokuji; Kobayashi, Yukitsugu; Tsukamoto, Hidehiko; and Maeda, Nobutaka, 3,938,375.

Maeda, Takeo, to Hitachi, Ltd. Variable frequency power converter for ac m otor drive. 3,939,387, Cl. 318-227.000.

Maertens, Dieter: *See—*
Zimmermann, Manfred; Lehnert, Guenther; Maertens, Dieter; and Pampus, Gottfried, 3,939,136.

Magdesian, Arkady Lukyanovich: *See—*
Ovchinnikov, Viktor Sergeevich; Grigorov, Eduard Ivanovich; Magdesian, Arkady Lukyanovich; Gorelikov, Vladimir Ivanovich; Bermishev, Andrei Vasilievich; Utkin, Alexandr Stepanovich; Fedotov, Viktor Konstantinovich; and Volkov, Vladimir Yakovlevich, 3,938,346.

Mages, Bernhard: *See—*
Rock, Erich; and Mages, Bernhard, 3,938,219.

Maggiolo, Allison, to Glen Raven Mills; and Peery, Lee H., part interest to each. Nondestructive method for quickly determining amount of lubricant on textile. 3,938,955, Cl. 23-230.300.

Magidson, Herbert; Huber, Otto L.; and Hennrich, Helmut, to Moldex, Inc. Method of construction of bra pad. 3,939,023, Cl. 156-211.000.

Magnaflux Corporation: *See—*
Rosauer, Peter J., 3,939,355.

Magoveny, George S.; and Forgo, Eric J., to Windsunwatt, Inc. Horizontal multidirectional turbine windmill. 3,938,907, Cl. 415-141.000.

Magyar Tudomanyos Akademia Muszaki Kemiai Kutato Intezete: *See—*
Ormos, Zoltan; Csukas, Bela; Stefko, Bela; Pataki, Karoly; Blickle, Tibor; and Felmeri, Jozsef, 3,938,259.

Maier, Eckhard; Ostermeier, Heinrich; Kormendi, Kalman; and Schinke, Friedel, to Elbatainer Kunststoff- und Verpackungs- Gesellschaft m.b.H.; and Sulo Eisenwerk Streuber & Lohmann. Barrel of synthetic material. 3,938,687, Cl. 220-5.00R.

Maisonville, Richard C., to Scans Associates, Inc. Method and apparatus for determining the timing angle in internal combustion engines. 3,939,397, Cl. 324-16.00T.

Majewski, Robert F.: *See—*
Lawson, John E.; Dennis, Ronnie D.; and Majewski, Robert F., 3,939,196.

Maki, Douglas W.: *See—*
Dickens, Lawrence E.; and Maki, Douglas W., 3,939,430.

Makoto, Kurose: *See—*
Kensaku, Yano; Makoto, Kurose; and Toshiaki, Nagamitsu, 3,938,609.

Makowski, Henry S.: *See—*
Lundberg, Robert D.; and Makowski, Henry S., 3,939,242.

Malamoud, Jean Gaston, to S.T. Dupont. Security device for a portable lighter. 3,938,943, Cl. 431-150.000.

Malcolm, J. Douglas, to Canadian Patents and Development Limited. Liquid fluidic device. 3,938,557, Cl. 137-834.000.

Malmgren, William A.; and Gearing, Bryan F., to GTE Automatic Electric Laboratories Incorporated. Communication switching system data retrieval and loading arrangement. 3,939,309, Cl. 179-18.0ES.

Malz, Ute K.: *See—*
Schmitz, Joseph F.; Malz, Ute K.; and Nordeen, Erwin, 3,938,216.

Mamula, Michael: *See—*
Foote, Kenneth R.; and Mamula, Michael, 3,938,444.

Manchester, William James, to PowerHold Products, Inc. Chuck of the indexing type. 3,938,816, Cl. 279-5.000.

Mancini, L. Phillip: *See—*
Ritota, Michael C.; and Mancini, L. Phillip, 3,938,521.

Mann, Donald V.; and Mann, Herman C. Auxiliary drive endless loop tape cartridge. 3,938,752, Cl. 242-55.19A.

Mann, Herman C.: *See—*
Mann, Donald V.; and Mann, Herman C., 3,938,752.

Mann, Hugh W.: *See—*
Wrenn, George T., Jr.; Mann, Hugh W.; and Sarma, Krishna R. K., 3,938,353.

Mannal, Clifford: *See—*
Gardiner, Paul C.; Gardner, Robert S.; Mannal, Clifford; and Payne, John H., 3,938,456.

Manning, John F.: *See—*
Gardner, John D.; and Manning, John F., 3,939,183.

Manufacturers Systems, Inc.: *See—*
Anderson, Leroy E., 3,938,558.

Mar-Chem, Incorporated: *See—*
Martin, Edwin B., 3,939,080.

Marathon Oil Company: *See—*
Farrar, Grover L.; and Storms, Phillip W., 3,939,198.
Ossip, Paul S.; and Dreher, Karl D., 3,938,591.
Rhudy, John S.; and Knight, Bruce L., 3,938,594.

Marbach, Walter V.: *See—*
Sheridan, Arthur L.; and Marbach, Walter V., 3,938,220.

March, Joseph E., to Platt Luggage, Inc. Fabricated case. 3,938,630, Cl. 190-24.000.

March Manufacturing Company: *See—*
Zimmermann, Frederick N., 3,938,914.

Marchetti, Joseph R.: *See*—
Anderson, Carl C.; and Marchetti, Joseph R., 3,939,051.

Mardesich, Nicholas: *See*—
Burger, Norman D., 3,938,708.

Marie, Gilbert, to Societe Nationale des Petroles d'Aquitaine. Process for the preparation of random copolymers of mono-olefins or of mono-olefins and unconjugated dienes with lactams with substitution on the nitrogen atom by an unsaturated radical. 3,939,129, Cl. 260-79.700.

Marie, Gilbert, to Societe Nationale des Petroles d'Aquitaine. Process for the preparation of random copolymers of mono-olefins or of mono-olefins and unconjugated dienes with unsaturated derivatives selected from N-vinylimidazoles and N-vinylimidazolines. 3,939,132, Cl. 260-80.720.

Marin, Heiner: *See*—
Noack, Dieter; and Marin, Heiner, 3,939,317.

Marion, Robert: *See*—
Dach, Hansjorg; Furtner, Horst; and Marion, Robert, 3,938,410.

Marizzoli, Luigi: *See*—
Delfiol, Lucio; and Marizzoli, Luigi, 3,938,399.

Marriner, John E. Flexible connection for articulating vessels. 3,938,461, Cl. 114-235.00R.

Marsan, Semen: *See*—
Polacek, Bohumil; and Marsan, Semen, 3,938,331.

Marsh, Douglas D.: *See*—
Herbolsheimer, Bruce E.; and Marsh, Douglas D., 3,938,766.

Marshall, Winston S.: *See*—
Lacefield, William B.; and Marshall, Winston S., 3,939,278.

Marsik, Stanley J.: *See*—
Philipp, Warren H.; Marsik, Stanley J.; and May, Charles E., 3,939,048.

Marszalek, Leszek; Lorenc, Tadeusz; and Hodbod, Andrzej, to Centralny Osrodek Badan i Rozwoju Techniki Kolejnictwa. Railway track brake. 3,938,629, Cl. 188-62.000.

Martha, Eugene F.: *See*—
Lanier, Terry O.; and Martha, Eugene F., 3,938,957.
Lanier, Terry O.; and Martha, Eugene F., 3,938,958.

Martin, Edwin B., to Mar-Chem, Incorporated. Composition for neutralizing static electricity. 3,939,080, Cl. 252-1.000.

Martin, Jacques Lucien Joseph, to Societe Anonyme dite: R.K.S. Roller cages formed from apertured separators for roller bearings. 3,938,866, Cl. 308-235.000.

Martin, Patrick S.; and Moody, Barron M., to Cryogenics Corporation of America. Freeze tunnel. 3,938,350, Cl. 62-156.000.

Martin, Robert G.: *See*—
Royka, Stephen F.; and Martin, Robert G., 3,938,993.

Martin, William F., to Raymond Lee Organization, Inc., The, a part interest. Slidable multipurpose container device. 3,938,819, Cl. 280-19.000.

Martinelli, Santino: *See*—
Gozzano, Renato; and Martinelli, Santino, 3,939,340.

Marvin Glass & Associates: *See*—
Morrison, Howard J.; and Keller, Albert G., 3,939,418.

Marwick, Edward F. Heat engines. 3,938,335, Cl. 60-673.000.

Mary, Jacques; and Merillou, Pierre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Facsimile receiver having movable printing bar. 3,939,481, Cl. 346-74.00E.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Reinforcement for tires and method of making same. 3,938,313, Cl. 57-149.000.

Masao Kurokawa: *See*—
Ohya, Shogo; Takagi, Momoyoshi; and Kurokawa, Masao, 3,939,027.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Isenberg, Gerhard; Bloch, Peter; and Tuzinsky, Wolfgang, 3,938,913.

Maskery, Arthur, to Westinghouse Brake & Signal Co., Ltd. Vehicle speed signal pulse source. 3,939,416, Cl. 324-174.000.

Masopust, Otto T., Jr.: *See*—
Berg, Richard D.; Brown, Donald R.; Masopust, Otto T., Jr.; and Stoltz, James F., 3,939,440.

Massachusetts Institute of Technology: *See*—
Dewey, C. Forbes, Jr., 3,938,365.
Sheehan, John C., 3,939,151.

Master Specialty Products: *See*—
Romolt, Abraham, 3,938,655.

Mastin, Robert H., to Whitehall Corporation. Differential charge amplifier for marine seismic applications. 3,939,468, Cl. 340-7.000.

Masuda, Takashi: *See*—
Amari, Shinji; and Masuda, Takashi, 3,939,485.

Masukawa, Toyoaki: *See*—
Fujiwhara, Mitsuto; Satoh, Ryosuke; Masukawa, Toyoaki; and Uozumi, Takahiro, 3,938,996.

Maten, Marvin A., Jr.: *See*—
Glance, Patrick M.; and Maten, Marvin A., Jr., 3,938,841.

Mathes, Stanley, to Syntex Puerto Rico, Inc. Inhalation device. 3,938,516, Cl. 128-266.000.

Mathues, Thomas P., to General Motors Corporation. Master cylinder. 3,938,333, Cl. 60-574.000.

Matsuda, Motonobu: *See*—
Nanba, Yasuhiro; Yamada, Seiji; and Matsuda, Motonobu, 3,938,893.

Matsui, Kazuma; Hoshino, Shigeo; and Kamiya, Sigeru, to Nippon Soken, Inc. Catalyst-type exhaust gas purifying device. 3,938,959, Cl. 23-288.0FC.

Matsui, Masanao; Kitamura, Seiichi; and Morioka, Masahiro, to Teikoku Chemical Industry Co., Ltd. Process for preparing polyene compounds. 3,939,202, Cl. 260-489.000.

Matsumoto, Akira; and Itani, Katsutoshi, to Tokai Denka Kogyo Kabushiki Kaisha. Etching solutions for copper and copper alloys and etching process using the same. 3,939,089, Cl. 252-79.400.

Matsumura, Eiichi: *See*—
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Matsushita, Eiji: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Otani, Hiroshi; and Oda, Fujio, 3,939,325.
Tomii, Kaoru, 3,939,486.

Matthews, Hugh B., to Sperry Rand Corporation. Geothermal energy control system and method. 3,938,334, Cl. 60-641.000.

Matthews, Russell B., to Johnson Service Company. Fuel ignition control arrangement. 3,938,937, Cl. 431-78.000.

Matthews, Virgil Edison; and Knopf, Robert John, to Union Carbide Corporation. Lightly cross-linked polyurethane hydrogels based on poly(alkylene ether) polyols. 3,939,123, Cl. 260-77.5AM.

Mattison, Phillip L.; and Swanson, Ronald R., to General Mills, Inc. Certain substituted 2-hydroxybenzophenoximes and the process of extracting copper therewith. 3,939,203, Cl. 260-566.00A.

Maurer, Ruprecht: *See*—
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Mausteller, John W.; McGoff, Miles J.; and Thiebaud, Daniel L., to Mine Safety Appliances Company. Emergency breathing apparatus. 3,938,512, Cl. 128-191.00R.

May, Charles E.: *See*—
Philipp, Warren H.; Marsik, Stanley J.; and May, Charles E., 3,939,048.

Mayer, Hans; and Nieschler, Werner, to Siemens Aktiengesellschaft. Steam generator having feed-water preheater. 3,938,473, Cl. 122-32.000.

Maynard, John T., to Armor Elevator Company, Inc. Transportation system with motor field control. 3,938,624, Cl. 187-29.00R.

Mazza, Benito Marcel, to Terry Industries. Switching circuit for ignition system. 3,938,491, Cl. 123-149.00C.

McCanse, James Edson: *See*—
Bennett, Max E.; McCanse, James Edson; Lawson, Gordon L.; and Clark, William H., 3,938,681.

McCauley, James W.; Viechnicki, Dennis J.; and Schmid, Frederick, to United States of America, Army. Fabrication of metal-ceramic composites. 3,939,003, Cl. 106-65.000.

McClelland, John R.: *See*—
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McClocklin, Samuel B.: *See*—
Solie, James C.; and McClocklin, Samuel B., 3,938,798.

McClure, Kenneth R., to Air Preheater Company, Inc., The. Bag filter cleaning device. 3,938,971, Cl. 55-300.000.

McCoy, Frederic C.; and Swanson, Carl Loyal W., deceased (by Swanson, Viola C., executrix), to Texaco Inc. Solubilizing process for oil insoluble pesticides. 3,939,272, Cl. 424-276.000.

McDavid, James E., Jr.; Truesdell, Stanley E.; and Chipps, Elmer Thomas, to Avery Products Corporation. Apparatus for dispensing adhesive labels. 3,938,698, Cl. 221-73.000.

McDonnell Douglas Corporation: *See*—
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McDowell-Wellman Engineering Company: *See*—
Ban, Thomas E., 3,938,987.

McDowell, Wendell V., to Bethlehem Steel Corporation. Apparatus for welding a joint between two closely spaced vertical members. 3,939,324, Cl. 219-126.000.

McFarland, James W.: *See*—
Abu-El-Haj, Marwan J.; and McFarland, James W., 3,939,174.

McFarland, Robert L.: *See*—
Kelly, Neil C.; McFarland, Robert L.; and Sampsell, Jack W., 3,939,463.

McGillvary, Daniel R.; and Sumerak, Joseph E., to Firestone Tire & Rubber Company, The. Method and apparatus for the distribution of non free-flowing composite mixtures. 3,938,562, Cl. 141-1.00R.

McGoff, Miles J.: *See*—
Mausteller, John W.; McGoff, Miles J.; and Thiebaud, Daniel L., 3,938,512.

McGrew, Dan. Ventilator for a toilet bowl. 3,938,201, Cl. 4-213.000.

McInerney, John P.: *See*—
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McIntosh, Arthur Edward: *See*—
Hartley, Kenneth; and McIntosh, Arthur Edward, 3,938,664.

McIntyre, Robert G.; and Minnich, Otto J., to McDonnell Douglas Corporation. Frangible aircraft floor. 3,938,764, Cl. 244-117.00R.

McKay, Norman J. Pattern voice coil transducer having permanent magnet plates of a single polarity. 3,939,312, Cl. 179-115.5PV.

McKenna, Matthew P., Jr.: *See*—
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McKie, David A.: *See*—
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McKinney, James T., to Minnesota Mining and Manufacturing Company. Prefilter-ionizer apparatus for use with quadrupole type secondary-ion mass spectrometers. 3,939,344, Cl. 250-281.000.

McKinnis, James A., to United States of America, Air Force. Method and apparatus for measuring linear thermal expansion of polymeric material. 3,938,889, Cl. 356-109.000.

McLaughlin, Carol Lynn: *See—*
Baile, Clifton A.; McLaughlin, Carol Lynn; and Webb, Robert Lee, 3,939,275.

MCM Industries, Inc.: *See—*
Meany, David P., 3,939,381.

McNeill, William Allen, to Akzona Incorporated. Method and means for multi-colored dyeing textile yarns. 3,938,952, Cl. 8-149.000.

McPhee, Charles J., to American Hospital Supply Corporation. Medical liquid container with a toggle film leak tester and method of leak testing with same. 3,938,519, Cl. 128-273.000.

McVicker, Gary B., to Exxon Research and Engineering Company. Preparation of zerovalent phosphine substituted rhodium compounds and their use in the selective carbonylation of olefins. 3,939,188, Cl. 260-429.00R.

Mead Johnson & Company: *See—*
Lawson, John E.; Dennis, Ronnie D.; and Majewski, Robert F., 3,939,196.

Meany, David P., to MCM Industries, Inc. Universal burn-in fixture. 3,939,381, Cl. 317-101.00R.

Mech-El Industries, Inc.: *See—*
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Medical Development Corporation: *See—*
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Medtronic, Inc.: *See—*
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Meehan, Linda B., administratrix: *See—*
Meehan, Richard J., deceased; Rein, Richard H.; and Willgohs, Ralph H., 3,939,323.

Meehan, Richard J., deceased (by Meehan, Linda B., administratrix); Rein, Richard H.; and Willgohs, Ralph H., to Union Carbide Corporation. Shielding gas for laser welding. 3,939,323, Cl. 219-121.0LM.

Meininger, Fritz; and Fuchs, Hermann, to Hoechst Aktiengesellschaft. Process for the preparation of a dyestuff consisting substantially of only unsymmetrical 1:2-chromium complex azo dyestuffs. 3,939,140, Cl. 260-145.00A.

Meininger, Fritz; and Hahnle, Reinhard, to Hoechst Aktiengesellschaft. Water-soluble copper complex phenyl azo naphthalene reactive dyestuffs. 3,939,141, Cl. 260-151.000.

Melnichuk, Oleg Ulyanovich: *See—*
Zakharov, Viktor Ivanovich; Zinichev, Alexandr Alexeevich; and Melnichuk, Oleg Ulyanovich, 3,939,423.

Mentha, John W.; Shaffner, Janice V.; and Cresswell, Ronald M., to Burroughs Wellcome Co. Intermediates for the preparation of pyrimidine compounds. 3,939,181, Cl. 260-340.700.

Menzel, Willi; and Milde, Gundolf, to Siemens Aktiengesellschaft. Structural arrangement for electronic modules. 3,939,441, Cl. 333-70.00R.

Mercer, Alec Victor: *See—*
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Merck & Co., Inc.: *See—*
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Merillou, Pierre: *See—*
Mary, Jacques; and Merillou, Pierre, 3,939,481.

Merle, Michel, to Andrew Corporation. Continuous corrugated waveguide and method of producing the same. 3,938,244, Cl. 29-600.000.

Merrill, Stewart H.: *See—*
Jadwin, Thomas A.; Khanna, Ravi; Merrill, Stewart H.; and Perry, Edmond S., 3,938,992.

Merten, Rudolf; Lewalter, Jurgen; and Zecher, Wilfried, to Bayer Aktiengesellschaft. Process for the preparation of compounds which contain hydantoin rings. 3,939,122, Cl. 260-77.50R.

Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
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Messner, Harold D.: *See—*
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Messrs Elettronica Aster S.r.l.: *See—*
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Messrs. Sioux Schuhfabriken Peter Sapper: *See—*
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Mester, Heinz, to U.S. Philips Corporation. Three-phase X-ray generator. 3,939,351, Cl. 250-402.000.

Mester, Heinz, to U.S. Philips Corporation. X-ray generator provided with starting load control. 3,939,352, Cl. 250-409.000.

Metafab Industries, Inc.: *See—*
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Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, to University of Illinois Foundation, The. Insecticidal biodegradable analogues of DDT. 3,939,277, Cl. 424-340.000.

Metelkin, Alexandr Ivanovich: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Koleshikova, Nina Ivanovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,938,951.

Mettler, Charles W. Quick-lock fish bag. 3,938,276, Cl. 43-55.000.

Metzger, Horst: *See—*
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Metzner, Arthur B.; Vaseleski, Raymond C.; and Lee, Wei-Kuo, to University of Delaware, The. Process for reducing the turbulent drag in conduits and around submerged objects. 3,938,536, Cl. 137-13.000.

Meyer, Herbert W. H., Jr., to Exxon Research and Engineering Company. Alcohol purification process. 3,939,217, Cl. 260-643.00D.

Meyer, Horst; Bossert, Freidrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-1,4-dihydropyridine derivatives. 3,939,171, Cl. 260-294.80D.

Meylan, Jean-Luc Charles. Apparatus for cooling continuous castings. 3,938,584, Cl. 164-283.00S.

Michaels, Alan S.: *See—*
Leeper, Harold M.; and Michaels, Alan S., 3,938,515.

Michel, Frank; and Szewczuk, Thomas M., to Westinghouse Electric Corporation. Slidable stator seal. 3,938,906, Cl. 415-139.000.

Michel, Max; and Dupuy, Georges, to Rhone-Poulenc Industries. Method of treating residual gases containing various compounds of sulphur. 3,939,250, Cl. 423-224.000.

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Middleton, James V.: *See—*
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Midwest Power Corporation: *See—*
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Miesel, John L.; and Wickiser, David I., to Eli Lilly and Company. 4-Substituted-5-cyano-7-nitro-2-(α,α-difluoroalkyl)benzimidazoles. 3,939,166, Cl. 260-293.600.

Milde, Gundolf: *See—*
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Milgram, Jerome H., to Offshore Devices, Inc. Inflation control valves. 3,938,704, Cl. 222-5.000.

Milkovic, Miran, to General Electric Company. Low cutoff digital pulse filter especially useful in electronic energy consumption meters. 3,939,413, Cl. 324-142.000.

Miller, A. Leslie, to Koppers Company, Inc. Adjustably positionable supersonic nozzle means. 3,938,743, Cl. 239-457.000.

Miller, Charles G.: *See—*
United States of America, National Aeronautics and Space Administration; Miller, Charles G.; and Stephens, James B., 3,938,367.

Miller, George E.; Griffith, Michael J.; and Van Rens, Russell J., to Outboard Marine Corporation. Thrust bearing arrangement for a rotary piston internal combustion engine having a vertical crankshaft. 3,938,477, Cl. 123-8.070.

Miller, William R., Jr., to USM Corporation. Gaging assembly for automatically controlled wheel lathes. 3,938,254, Cl. 33-203.110.

Millett, James A.; and Raymond, James W., to Raymond, James W. Lock assembly. 3,938,359, Cl. 70-363.000.

Milligan, Robert T.; and Vernon, Robert H. Paint container. 3,938,686, Cl. 215-232.000.

Milo, Simcha. Central flow prosthetic cardiac valve. 3,938,197, Cl. 3-1.500.

Mine Safety Appliances Company: *See—*
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Mineda, Hisahal: *See—*
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Mitchell, James G.; Mitchell, Winalee G.; and Purdy, Paul D., to Mitchell, James G.; and Mitchell, Winalee G. Scuff slipper and method and apparatus for the manufacture thereof. 3,938,210, Cl. 12-1.00W.

Mitchell, William Eric, to Dunlop Limited. Rims for pneumatic tires. 3,938,576, Cl. 152-379.00R.

Mitchell, Winalee G.: *See—*
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Mitsubishi Chemical Industries Ltd.: *See—*
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Mitsui Mining & Smelting Co., Ltd.: *See—*
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Mitsui Petrochemical Industries, Inc.: *See—*
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Miyake, Yoshihiko: *See—*
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Miyaoka, Tadashi. Universal pipe joint construction. 3,938,833, Cl. 285-166.000.

Miyoshi, Katsunori: *See—*
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Mogensen, Rasmus Langballe; and Sallerup, Hans Erik, to Tempress A/S. Measuring instruments. 3,938,393, Cl. 73-431.000.

Mogilevsky, Vitaly Moritsovich; Ekimov, Vadim Petrovich; Erastov, Alexandr Petrovich; and Posokhin, Viktor Vladimirovich. Oscillographic ferrometer. 3,939,402, Cl. 324-34.00R.

Mohr, Johannes, to Karl M. Reich Maschinenfabrik. Method and machine for conveying and aligning rod-shaped fasteners. 3,938,654, Cl. 198-287.000.

Moldex, Inc.: *See—*
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Molina, Orlando G., to Rockwell International Corporation. Water washable dye penetrant and method for utilizing same. 3,939,092, Cl. 252-301.20P.

Molina, Orlando G., to Rockwell International Corporation. Composition for ultrasonic inspection of objects and method for employing same. 3,939,101, Cl. 252-408.00R.

Momberg, Vernon B. Liquid level tamper alarm. 3,939,471, Cl. 340-59.000.

Monsanto Company: *See—*
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Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Enzymatic bating method. 3,939,040, Cl. 195-6.000.

Montecatini Edison S.p.A.: *See—*
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Montedison S.p.A.: *See—*
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Moore, Lewis Frank; and Price, George McNair, to Frymaster Corporation, The. Cooking system. 3,938,948, Cl. 431-347.000.

Moore, William Percy; and Agee, John Harvey, to Allied Chemical Corporation. Process for production of ammonium polyphosphates. 3,939,255, Cl. 423-313.000.

Morandi, Giorgio: *See—*
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Morell, Juan Coll. Connecting device for wires. 3,938,902, Cl. 403-391.000.

Moreton, George C., to Electronic Data Controls Corporation. Blender. 3,938,784, Cl. 259-8.000.

Morikawa, Atsuko: *See—*
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Morikawa, Hiroyuki; Sugimoto, Tosio; and Sato, Kazuo, to Mitsui Petrochemical Industries, Inc. 2,4-Dimethyl-4-vinyl-1-cyclohexene-2,6-or 3,6-dimethyl-1,3,6-octatriene copolymer resin. 3,939,131, Cl. 260-80.700.

Morimitsu, Nobutaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Linear oil seal means principally intended to obtain an oil scraping effect. 3,938,917, Cl. 418-142.000.

Morinaga, Kazuto: *See—*
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Morita, Takayuki: *See—*
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Morokawa, Shigeru; Hashimoto, Yukio; and Nishikubo, Yasuhiko, to Citizen Watch Co., Ltd. Temperature compensated electronic timepiece. 3,938,316, Cl. 58-23.00R.

Morrison, Howard J.; and Keller, Albert G., to Marvin Glass & Associates. Walkie-talkie device. 3,939,418, Cl. 325-16.000.

Morrow, Robert S.; and Penn, Lloyd D., to IRD Mechanalysis, Inc. Combination balance analyzer and vibration spectrum analyzer. 3,938,394, Cl. 73-462.000.

Morton, Clyde M. Two-stroke internal combustion engine. 3,938,481, Cl. 123-69.00R.

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Moser, Rabin: *See—*
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Motoren- und Turbinen-Union Munchen GmbH: *See—*
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Motorola, Inc.: *See—*
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Motovilin, Alexandr Vasilievich: *See—*
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Mott, James D., to Hydril Company. Drilling tool. 3,938,589, Cl. 166-224.00A.

Moule, Richard D., to Franklin Electric Subsidiaries, Inc. Apparatus for receiving and acknowledging the return of a vehicle at a check-in station. 3,938,638, Cl. 194-4.00C.

Moustafa, Emad T.: *See—*
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Muck, Karl-Friedrich: *See—*
Paschalis, Stratos; Kern, Rudolf; and Muck, Karl-Friedrich, 3,938,953.

Mueller, David J., to Quasar Electronics Corporation. Automatic fine tuning defeat circuit. 3,939,427, Cl. 325-418.000.

Mueller, Reinhard, to Teves-Thompson GmbH. Valve stem retainer. 3,938,484, Cl. 123-90.670.

Muller, Arno, to Omni Ray AG. Apparatus for advancing the feed frame of an automatic embroidery machine. 3,938,453, Cl. 112-102.000.

Muller, Arnold. Variable speed three-phase motor. 3,939,370, Cl. 310-125.000.

Muller, Erich: *See—*
Nickl, Josef; Muller, Erich; Narr, Berthold; and Roch, Josef, 3,939,268.

Muller, Marcel: *See—*
Alig, Leo; Furst, Andor; and Muller, Marcel, 3,939,193.

Muller, Willi: *See—*
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Murachi, Mikio: *See—*
Noda, Fumiyoshi; and Murachi, Mikio, 3,938,232.

Murakami, Kiyoharu, to Kabushiki Kaisha Daikin Seisakusho. Control system for forward-reverse clutches and low pressure supply line. 3,938,637, Cl. 192-113.00R.

Murakami, Masuo; Isaka, Ichiro; Nakano, Khozi; Souzu, Isao; Koda, Akio; Ozasa, Teruaki; Kashiwagi, Teruya; and Murakami, Yukiyasu, to Yamanouchi Pharmaceutical Co., Ltd. Penicillin derivatives. 3,939,150, Cl. 260-239.100.

Murakami, Tadao, to Hitachi, Ltd. Rotary electric machine. 3,939,371, Cl. 310-154.000.

Murakami, Yukiyasu: *See—*
Murakami, Masuo; Isaka, Ichiro; Nakano, Khozi; Souzu, Isao; Koda, Akio; Ozasa, Teruaki; Kashiwagi, Teruya; and Murakami, Yukiyasu, 3,939,150.

Murase, Genyo; Mineda, Hisahal; and Yamaguchi, Yozo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Energy absorbing steering assembly. 3,938,404, Cl. 74-492.000.

Murase, Kenji: *See—*
Andoh, Shizuo; and Murase, Kenji, 3,939,454.

Murata, Yoshifumi: *See—*
Kurata, Tokuzo; Okano, Takeshi; Ohfuchi, Kunihiko; Tamaru, Akio; Murata, Yoshifumi; and Nagashima, Saburo, 3,939,205.

Murphy, Milford R., to Textron, Inc. Rotor blade force track sensing system and automatic span tracking system. 3,938,762, Cl. 244-17.130.

Murray, William Young: *See—*
Gosling, Cyril Henry; Glick, David; Powell, Alan Leslie; and Murray, William Young, 3,939,298.

Musher, Evelyn: *See—*
Musher, Jeremy; and Su, Kai, 3,939,190.

Musher, Jeremy; and Su, Kai, to Musher, Evelyn. Group V pentavalent atom-containing compositions. 3,939,190, Cl. 260-446.000.

Mutschler, Otto. Stylograph. 3,938,899, Cl. 401-260.000.

Mutziger, John Stefan, to Deere & Company. Apparatus and method for making decay rate measurements. 3,939,405, Cl. 324-57.00R.

Myers Industries, Inc.: *See—*
Bartholomew, Allan E., 3,938,871.

Myers, Robert A.: *See—*
Hall, William J.; and Myers, Robert A., 3,939,225.

Nabinger, Herman G. Invalid cart and lift. 3,938,820, Cl. 280-47.110.

Nagai, Hiroshi; and Miyake, Yoshihiko, to Hitachi, Ltd. Method for adjusting the angle of attack of a floating magnetic head. 3,939,495, Cl. 360-103.000.

Nagasaki, Tadashi; Kimura, Isamu; and Tamura, Shingo, to Hitachi, Ltd. High voltage rectifying arrangement having a fixing piece for an input terminal. 3,939,393, Cl. 321-15.000.

Nagashima, Saburo: *See—*
Kurata, Tokuzo; Okano, Takeshi; Ohfuchi, Kunihiko; Tamaru, Akio; Murata, Yoshifumi; and Nagashima, Saburo, 3,939,205.

Nagata, Takeshi, to Nippon Steel Corporation; and Hamada Heavy Industries Co., Ltd. Treatment of blast furnace slag. 3,938,975, Cl. 65-19.000.

Nagazumi, Yasuo, to Nissan Motor Company Limited. Mechanical energy absorbing device and safety harness using the same. 3,938,627, Cl. 188-1.00C.

Nagel, Otto; Kuerten, Heribert; and Zehner, Peter, to BASF Aktiengesellschaft. Process for drawing in and compressing gases and mixing the same with liquid material. 3,938,738, Cl. 239-9.000.

Nagumo, Tadanobu: *See—*
Nishi, Takuji; Mitsuhashi, Kenhachi; and Nagumo, Tadanobu, 3,938,572.

Nagy, Nicholas; and Egerton, Clinton F., to International Telephone and Telegraph Corporation. Access cover with moveable attaching devices for underground pumping stations and other installations. 3,938,545, Cl. 137-363.000.

Naito, Hirokuni; Yoshimura, Isao; and Tashiro, Hisao, to Asahi Dow, Ltd. Method of making a fluid transmitting porous tube or sheet. 3,939,237, Cl. 264-54.000.

Nakagawa, Jihei, to Olympus Optical Co., Ltd. Large aperture photographic lens system. 3,938,884, Cl. 350-215.000.

Nakajima, Yasuo; Hayashi, Yoshimasa; and Yamamoto, Tadahiro, to Nissan Motor Company Limited. Exhaust manifold with sluice valve. 3,938,330, Cl. 60-294.000.

Nakamori, Yasuo, to Sanyo Onkyo Seiki Co. Ltd. Starter device for toys. 3,938,278, Cl. 46-202.000.

Nakamura, Tadasi: *See—*
Asano, Setunobu; and Nakamura, Tadasi, 3,939,191.

Nakamura, Takao; Hirose, Itsuo; Misawa, Rokuro; Horii, Hidenori; Hagio, Akira; and Sada, Tetsuo, to Nippon Kokan Kabushiki Kaisha. Method of making butt welded tubes. 3,938,724, Cl. 228-147.000.

Nakano, Khozi: *See—*
Murakami, Masuo; Isaka, Ichiro; Nakano, Khozi; Souzu, Isao; Koda, Akio; Ozasa, Teruaki; Kashiwagi, Teruya; and Murakami, Yukiyasu, 3,939,150.

Nakayama, Hiroshi, to Iwatani & Co., Ltd. Electric timer switch. 3,939,384, Cl. 317-141.00S.

Nakayama, Kiyoshi; Kobata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, to Kyowa Hakko Kogyo Co., Ltd. Process for the production of L-glutamic acid. 3,939,042, Cl. 195-49.000.

Nakayama, Yasuhiro: *See—*
Yoneyama, Masakazu; Yamamoto, Nobuo; Sugimoto, Naohiko; Horie, Ikutaro; and Nakayama, Yasuhiro, 3,938,999.

Nanba, Yasuhiro; Yamada, Seiji; and Matsuda, Motonobu, to Minolta Camera Kabushiki Kaisha. Image focussing mechanism. 3,938,893, Cl. 356-125.000.

Nanba, Yasuhiro, to Minolta Camera Kabushiki Kaisha. Focus detecting device. 3,938,894, Cl. 356-125.000.

Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, to Abbott Laboratories. Antibiotics designated XK-88 series and process for production thereof. 3,939,043, Cl. 195-80.00R.

Narr, Berthold: *See—*
Nickl, Josef; Muller, Erich; Narr, Berthold; and Roch, Josef, 3,939,268.

Nasser, Benny E.: *See—*
Hogan, John P.; Nasser, Benny E.; and Delap, Joseph A., 3,939,137.

National Research Development Corporation: *See—*
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National Starch and Chemical Corporation: *See—*
Sirota, Julius; and McKenna, Matthew P., Jr., 3,939,108.

Nau, Harold Henry, to American Cyanamid Company. Apparatus for coating particulate material with finely divided solids. 3,938,469, Cl. 118-303.000.

Nayler, John Herbert Charles; Pearson, Michael John; and Southgate, Robert, to Beecham Group Limited. 3-Benzyl-7-substituted acetamido-3-cephem-4-carboxylic acids and halogenated benzyl derivatives. 3,939,157, Cl. 260-243.00C.

NCR Corporation: *See—*
Pandey, Raghvendra K., 3,939,252.

Nedsten, Hans Ludvig, to AB Stridsberg & Blorck. Noise-suppressed circular saw blade. 3,938,417, Cl. 83-835.000.

Needham, Donald G., to Phillips Petroleum Company. Thermoplastic resin composition having high impact strength. 3,939,112, Cl. 260-33.6AQ.

Nehushtan, Jacob; and Schusberger, Meyer, to Tadiran Israel Electronics Industries Ltd. Battery charging and discharging system. 3,939,359, Cl. 307-66.000.

Nejtek, George: *See—*
Steele, William Henry; and Nejtek, George, 3,939,231.

Nelson, Larry Allan, to Tektronix, Inc. FM limiter with input level sensing and TTL level output. 3,939,432, Cl. 328-13.000.

Nelson, Richard Donald. Air filter restriction indicating device. 3,939,457, Cl. 340-239.00F.

Nelson, Robert E., to General Motors Corporation. Starting system for a helicopter power plant control. 3,938,320, Cl. 60-39.140.

Neotec Corporation: *See—*
Selgin, Paul J., 3,938,896.

Nerska, Karl, to Lipe-Rollway Corporation. Self-adjusting cover assembly for friction clutches improvement. 3,938,636, Cl. 192-111.00A.

Neugebauer, Gunter: *See—*
Albrecht, Hans Peter; and Neugebauer, Gunter, 3,939,156.

New England Nuclear Corporation: *See—*
Kauffman, Joel M., 3,939,094.

Newman, Norman: *See—*
Fisch, Richard S.; and Newman, Norman, 3,938,997.
Fisch, Richard S.; and Newman, Norman, 3,938,998.

Nichiban Co., Ltd.: *See—*
Tanaka, Iwao; Shiratori, Yukio; and Iijima, Hidetaro, 3,939,034.

Nicholas, Michael George: *See—*
Old, Charles Fraser; Nicholas, Michael George; and Howlett, Brian Wilfred, deceased, 3,938,579.

Nickl, Josef; Muller, Erich; Narr, Berthold; and Roch, Josef, to Boehringer Ingelheim GmbH. 2,4-Diamino substituted pyridol(3,2-d)pyrimidine as antithrombotic agents. 3,939,268, Cl. 424-246.000.

Nicolaisen, Bernard H., to Olin Corporation. Process for preparing alkali metal orthophosphates and ammonia. 3,939,254, Cl. 423-312.000.

Niemann, Elfriede, to Hoechst Aktiengesellschaft. Process for the manufacture of human transferrin labelled with indium 113m. 3,939,258, Cl. 424-1.000.

Nieschler, Werner: *See—*
Mayer, Hans; and Nieschler, Werner, 3,938,473.

Nikonova, Tatyana Vladimirovna: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Koleshikova, Nina Ivanovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,938,951.

Nippon Electric Co., Ltd.: *See—*
Funatsu, Michiro; and Matsumura, Eiichi, 3,939,399.
Suda, Kazuyoshi; Isono, Tomoyuki; and Yashima, Teruo, 3,938,435.
Tsunemitsu, Hideo; and Shiba, Hiroshi, 3,939,047.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Ogita, Minoru, 3,939,442.

Nippon Kokan Kabushiki Kaisha: *See—*
Nakamura, Takao; Hirose, Itsuo; Misawa, Rokuro; Horii, Hidenori; Hagio, Akira; and Sada, Tetsuo, 3,938,724.

Nippon Soken, Inc.: *See—*
Matsui, Kazuma; Hoshino, Shigeo; and Kamiya, Sigeru, 3,938,959.

Nippon Steel Corporation: *See—*
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Takada, Tsutomu; Toyota, Toshio; Ogasawara, Akinobu; and Yamato, Syunsuke, 3,938,382.

Nippon Zeon Co., Ltd.: *See—*
Suzuki, Souichi; Horino, Hiroshi; and Ohishi, Tetsu, 3,939,138.

Nippondenso Co., Ltd.: *See—*
Arai, Hiroshi; Ohta, Jun; Taniguchi, Koichi; Sakurai, Yasuhiko; and Ohtake, Toshikazu, 3,939,470.
Takeda, Yoshiaki, 3,938,489.

Nisbet, Kenneth J., to Ford Motor Company. Force limiting device for a motor vehicle parking brake. 3,938,406, Cl. 74-512.000.

Nisbet, Kenneth J., to Ford Motor Company. Variable ratio parking brake control. 3,938,407, Cl. 74-516.000.

Nishi, Takuji; Mitsuhashi, Kenhachi; and Nagumo, Tadanobu, to Yokohama Rubber Co. Ltd., The. Crack prevention for pneumatic tire. 3,938,572, Cl. 152-209.00R.

Nishibayashi, Yoshifumi; Shimizu, Atsushi; Shiga, Yasuhiro; Okabe, Kenji; and Baba, Ken-ichi, to Toyo Cloth Co., Ltd. Process for producing artificial leather. 3,939,021, Cl. 156-78.000.

Nishikubo, Yasuhiko: *See—*
Morokawa, Shigeru; Hashimoto, Yukio; and Nishikubo, Yasuhiko, 3,938,316.

Nishitani, Kiyoshi; Kawada, Kimihiro; Ebina, Riyuzo; and Miyoshi, Katsunori, to Mitsubishi Chemical Industries Ltd. Plastic pallet. 3,938,448, Cl. 108-58.000.

Nishiyama, Toshiki. Passage structures for use in acquiring the techniques for driving motor cycles. 3,938,904, Cl. 404-35.000.

Nissan Motor Company Limited: *See—*
Hiruma, Mituo, 3,938,823.
Nagazumi, Yasuo, 3,938,627.
Nakajima, Yasuo; Hayashi, Yoshimasa; and Yamamoto, Tadahiro, 3,938,330.

Nissen Corporation: *See—*
Nissen, George P., 3,938,792.

Nissen, George P., to Nissen Corporation. Protective end covers for the resilient suspension members of trampoline beds and the like. 3,938,792, Cl. 267-69.000.

Nisso-Sangyo Co. Ltd.: *See—*
Kurabayashi, Kinji; and Ono, Tatsuo, 3,938,619.

Noack, Dieter; and Marin, Heiner, to Siemens Aktiengesellschaft. Electric compressed-gas circuit breaker. 3,939,317, Cl. 200-148.00A.

Noda, Fumiyoshi; and Murachi, Mikio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of manufacturing catalyst type exhaust gas purifier. 3,938,232, Cl. 29-157.00R.

Noda, Tomimitsu: *See—*
Tamano, Motokazu; Noda, Tomimitsu; and Yoshioka, Masanobu, 3,939,319.

Noguera, John Michael. Yarn spinning apparatus. 3,938,312, Cl. 57-103.000.

Nomura, Tadaaki: *See—*
Nakayama, Kiyoshi; Kobata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, 3,939,042.

Nopper, Peter, to Zumbach Electronic - Automatic. Positioning control apparatus. 3,939,389, Cl. 318-578.000.

Nordeen, Erwin: *See—*
Schmitz, Joseph F.; Malz, Ute K.; and Nordeen, Erwin, 3,938,216.

Nordgren, Gunnar, to Oy Suomen Vanutehdas - Finwad Ltd. Pretearing device for dry plates of wood pulp. 3,938,746, Cl. 241-186.00R.

Nordmann, Adolf, to Rheinmetall GmbH. Rammer for projectiles. 3,938,421, Cl. 89-47.000.

Norlin Music, Inc.: *See—*
Crooks, Robert Clement Allen, 3,939,305.

Norris, George W., to Crouse-Hinds Company. Cable tray. 3,938,767, Cl. 248-58.000.

Norsk Hydro A. S.: *See—*
Fonne, Gunnar Johan, 3,938,279.

Nothiger, Paul J. Rope climber. 3,938,620, Cl. 182-135.000.

Novak, Larry T.: *See—*
Brantingham, George L.; Phillips, Louis H.; and Novak, Larry T., 3,939,335.

Nunneley, J. David, to Frank W. Murphy Manufacturer, Inc. Tattletale annuciator and shut-down control for compressors or like equipment. 3,938,549, Cl. 137-557.000.

Nutmeg Sanitation Inc.: *See—*
Jaronko, John C.; and Jaronko, John T., 3,938,450.

N.V. Industrieele Handelscombinatie Holland: *See—*
de Bree, Siegfried Emilius Maria, 3,938,908.

Nygaard, Sven; and Larsen, Rex Stemann, to Eskofot A/S. Reproduction camera. 3,938,887, Cl. 355-63.000.

Oberstadt, Allan L., to Bendix Corporation, The. Exhaust gas sensor operating temperature detection system. 3,938,479, Cl. 123-32.0EA.

O'Brien, James E.: *See—*
Wurst, John W.; and O'Brien, James E., 3,939,372.

Oda, Fujio: *See—*
Otani, Hiroshi; and Oda, Fujio, 3,939,325.

Oda, Roy; De Frayne, Garry O.; and Walker, Paul L., to Chrysler Corporation. Vehicle lamp construction. 3,939,337, Cl. 240-8.300.

Oehlert, Yves: *See—*
Lacan, Guy; and Oehlert, Yves, 3,939,382.

Oestmann, Eldon D.: *See—*
Shelby, Robert L.; and Oestmann, Eldon D., 3,938,851.

Offshore Devices, Inc.: *See—*
Milgram, Jerome H., 3,938,704.

Ogasawara, Akinobu: *See—*
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Ogawa, Kazuhiro: *See—*
Fueki, Shimetomo; Ohuchi, Shigeo; and Ogawa, Kazuhiro, 3,939,056.

Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha. Ceramic filter circuit. 3,939,442, Cl. 333-72.000.

Oglesby, Cecil D., to Borg-Warner Corporation. Pneumatically controlled fuel injection system. 3,938,486, Cl. 123-119.00R.

Ohfuchi, Kunihiko: *See—*
Kurata, Tokuzo; Okano, Takeshi; Ohfuchi, Kunihiko; Tamaru, Akio; Murata, Yoshifumi; and Nagashima, Saburo, 3,939,205.

Ohishi, Tetsu: *See—*
Suzuki, Souichi; Horino, Hiroshi; and Ohishi, Tetsu, 3,939,138.

Ohmi, Atsushi, to Aisin Seiki Kabushiki Kaisha. Brake servo-motor. 3,938,424, Cl. 91-369.00B.

Ohosawa, Hiroshi: *See—*
Kawano, Takatsugu; Kojima, Hiroshige; Ohosawa, Hiroshi; and Morinaga, Kazuto, 3,939,279.

Ohta, Jun: *See—*
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Ohtake, Toshikazu: *See—*
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Ohuchi, Shigeo: *See—*
Fueki, Shimetomo; Ohuchi, Shigeo; and Ogawa, Kazuhiro, 3,939,056.

Ohya, Shogo; Takagi, Momoyoshi; and Kurokawa, Masao, to Masao Kurokawa. Method of bonding fluoro plastics to a base. 3,939,027, Cl. 156-306.000.

Oinuma, Shigeru: *See—*
Terada, Kimio; Fujita, Satoshi; Oinuma, Shigeru; and Kohno, Hiroshige, 3,939,290.

Oishi, Michiro, to Asahi Kogyo Kabushiki Kaisha. High numerical aperture intermediate wide angle objective. 3,938,882, Cl. 350-214.000.

Okabe, Kenji: *See—*
Nishibayashi, Yoshifumi; Shimizu, Atsushi; Shiga, Yasuhiro; Okabe, Kenji; and Baba, Ken-ichi, 3,939,021.

Okachi, Ryo: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 3,939,043.

Okada, Tomoyuki; and Suda, Seiji, to Hitachi, Ltd. Feedback circuit. 3,939,433, Cl. 330-25.000.

Okano, Takeshi: *See—*
Kurata, Tokuzo; Okano, Takeshi; Ohfuchi, Kunihiko; Tamaru, Akio; Murata, Yoshifumi; and Nagashima, Saburo, 3,939,205.

Okitsu, Kingo: *See—*
Yoshizu, Koji; and Okitsu, Kingo, 3,938,485.

Okuda, Shinji, to Sony Corporation. Resilient tape guide assembly for tape recording and/or reproducing apparatus. 3,939,494, Cl. 360-84.000.

Old, Charles Fraser; Nicholas, Michael George; and Howlett, Brian Wilfred, deceased (by Howlett, Margaret, administratrix), to United Kingdom Atomic Energy Authority. Method of producing composite bearing materials. 3,938,579, Cl. 164-87.000.

Olin Corporation: *See—*
Dooley, James K.; and Cook, Ralph L., 3,938,440.
Nicolaisen, Bernard H., 3,939,254.

Olofsson, Hans Kristoffer, to Atlas Copco Aktiebolag. Screw rotor machine with hollow thread rotor enclosing a screw cam rotor. 3,938,915, Cl. 418-9.000.

Olson, Robert K.: *See—*
Hansen, Kenneth P.; and Olson, Robert K., 3,938,778.

Olthow, Viktor Semenovich: *See—*
Ivanov, Evgeny Illarinovich; Olthow, Viktor Semenovich; Kostyrya, Evgeny Dmitrievich; and Derkach, Nikolai Dmitrievich, 3,938,596.

Olympic Instruments Inc.: *See—*
Craven, Truxtun; Crecelius, Carlyle A.; and Philbrick, Clayton W., 3,938,781.

Olympus Optical Co., Ltd.: *See—*
Nakagawa, Jihei, 3,938,884.

Omni Ray AG: *See—*
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Ono, Tatsuo: *See—*
Kurabayashi, Kinji; and Ono, Tatsuo, 3,938,619.

Onopchenko, Anatoli: *See—*
Barie, Walter P., Jr.; Onopchenko, Anatoli; and Schulz, Johann G. D., 3,939,109.

Oostenbrink, Albertus Antony, to Wavin B.V. Pipe connection for plastic pipes comprising a transversely or helically corrugated pipe-connecting part. 3,938,834, Cl. 285-235.000.

Opelt, Christian, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh. Max Grundig. Apparatus for assembling video sequences on tape in phase synchronization. 3,939,490, Cl. 360-14.000.

Optical Coating Laboratory, Inc.: *See—*
Riedel, Hans J.; and Spellman, Vernon C., 3,938,347.

Oregon, The United States National Bank of, executor: *See—*
Andrews, Alvadore M., deceased, 3,938,928.

Orendi, Roderich, to Gustav Wagner Maschinenfabrik. Circular saw blade. 3,938,418, Cl. 83-839.000.

Ormos, Zoltan; Csukas, Bela; Stefko, Bela; Pataki, Karoly; Blickle, Tibor; and Felmeri, Jozsef, to Richter Gedeon Vegyeszeti Gyar Rt; and Magyar Tudomanyos Akademia Muszaki Kemiai Kutato Intezete. Process for continuous drying of chemical products by milling-fluidisation. 3,938,259, Cl. 34-10.000.

Ortega, Robert. Valve construction. 3,938,553, Cl. 137-625.470.

Orwig, David F.; and Roecklein, Robert G., to Spicecraft, Inc. Sterilizing apparatus and process. 3,939,287, Cl. 426-316.000.

Osbon, William O.: *See—*
Putman, Thomas H.; and Osbon, William O., 3,938,538.

O'Shea, Francis X., to Uniroyal, Inc. Aromatic polyether-polythioether-polysulfone thermoplastics. 3,939,119, Cl. 260-49.000.

Oshima, Shigeru, to Fuji Photo Film Co., Ltd. Film tension maintenance means for use in roll-film camera. 3,938,753, Cl. 242-71.200.

Ossip, Paul S.; and Dreher, Karl D., to Marathon Oil Company. Intermediate fluid systems for long distance oil displacement. 3,938,591, Cl. 166-275.000.

Ostermeier, Heinrich: *See—*
Maier, Eckhard; Ostermeier, Heinrich; Kormendi, Kalman; and Schinke, Friedel, 3,938,687.

Ostertag, Alfred: *See—*
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Ostler, David S.: *See—*
Holbrook, Legrand K.; and Ostler, David S., 3,938,540.

O'Sullivan, Thomas F.; and Knol, Henricus J., to Lummus Company, The. Fired heater with double casing. 3,938,475, Cl. 122-333.000.

Otani, Hiroshi; and Oda, Fujio, to Matsushita Electric Industrial Co., Ltd. Thermal record printer head and method of making the same. 3,939,325, Cl. 219-216.000.

Othmer, Donald F. Method for producing aluminum metal from its salts. 3,938,988, Cl. 75-10.00R.

Outboard Marine Corporation: *See—*
Densow, Ulrich O., 3,938,622.
Irgens, Finn T., 3,938,458.
Miller, George E.; Griffith, Michael J.; and Van Rens, Russell J., 3,938,477.

Outokumpu OY: *See—*
Leiponen, Matti Olavi; and Kivisto, Tuomo Veikko Juhani, 3,938,672.

Ovchinnikov, Viktor Sergeevich; Grigorov, Eduard Ivanovich; Magdesian, Arkady Lukyanovich; Gorelikov, Vladimir Ivanovich; Bermishev, Andrei Vasilievich; Utkin, Alexandr Stepanovich; Fedotov, Viktor Konstantinovich; and Volkov, Vladimir Yakovlevich. Cryostat. 3,938,346, Cl. 62-50.000.

Over, William Roderick; and Gress, Paul William, to AMP Incorporated. Method and apparatus for attaching multi-conductor flat cable to an electrical connector. 3,938,246, Cl. 29-628.000.

Owatonna Tool Company: *See—*
Solie, James C.; and McClocklin, Samuel B., 3,938,798.

Owen, Ronald Charles, to Illinois Tool Works Inc. Container carrier and method of making same. 3,938,656, Cl. 206-150.000.

Owens-Corning Fiberglas Corporation: *See—*
Gilbu, Agnar, 3,938,285.
Marzocchi, Alfred, 3,938,313.

Owens-Illinois, Inc.: *See—*
St. John, Douglas F., 3,938,981.

Oy Suomen Vanutehdas - Finwad Ltd.: *See—*
Nordgren, Gunnar, 3,938,746.

Ozasa, Teruaki: *See—*
Murakami, Masuo; Isaka, Ichiro; Nakano, Khozi; Souzu, Isao; Koda, Akio; Ozasa, Teruaki; Kashiwagi, Teruya; and Murakami, Yukiyasu, 3,939,150.

P. R. Mallory & Co. Inc.: *See—*
Zaleski, John F., 3,939,011.

Pace, J. Don. Movable supporting device for milking apparatus. 3,938,470, Cl. 119-14.100.

Packaging Aids, Inc.: *See—*
Coppersmith, Morris, 3,938,714.

Pahl, Otto Andrew. Snow cradle. 3,938,843, Cl. 294-54.000.

Pampus, Gottfried: *See—*
Zimmermann, Manfred; Lehnert, Guenther; Maertens, Dieter; and Pampus, Gottfried, 3,939,136.

Pamuk, Janos: *See—*
Biro, Oszkar; Danyi, Edit; Fenyvesi, Magdolna; and Pamuk, Janos, 3,939,443.

Pandey, Raghvendra K., to NCR Corporation. Dilithium heptamolybdotetragadolinate. 3,939,252, Cl. 423-263.000.

Pandjiris Weldment Co., The: *See—*
Frederick, Arthur I., 3,938,797.

Pangborn, Jon B.; and Sharer, John C., to American Gas Association. Process for producing hydrogen from water. 3,939,257, Cl. 423-658.000.

Paolinelli, Antonio: *See—*
Piccolo, Luigi; Paolinelli, Antonio; and Ghirga, Marcello, 3,939,244.

Papenfuhs, Theodor; Spietschka, Ernst; and Troster, Helmut, to Hoechst Aktiengesellschaft. Daylight fluorescent pigments. 3,939,093, Cl. 252-301.20R.

Park, Robert H., to United States of America, Navy. Detection streamer. 3,939,469, Cl. 340-10.000.

Parker, Russell H. R., to Universe Machine Company, Inc. Mechanism for feeding and transporting brush blanks. 3,938,643, Cl. 198-19.000.

Parks, Gerald J., Jr.: *See—*
Folsom, Theodore R.; Parks, Gerald J., Jr.; and Weitz, William E., Jr., 3,938,888.

Parvulescu, Antares, to United States of America, Navy. Correlation system using matched signals. 3,939,461, Cl. 340-3.00R.

Paschalis, Stratos; Kern, Rudolf; and Muck, Karl-Friedrich, to Hoechst Aktiengesellschaft. Process and device for blood examination using substances labelled with radioactive nuclides. 3,938,953, Cl. 23-230.00B.

Pataki, Karoly: *See—*
Ormos, Zoltan; Csukas, Bela; Stefko, Bela; Pataki, Karoly; Blickle, Tibor; and Felmeri, Jozsef, 3,938,259.

Patel, Anil U.; DePhillips, James V.; and Peyser, Harry A., to Continental Can Company, Inc. Non-detachable easy open flap and tab assembly. 3,938,693, Cl. 220-267.000.

Patel, Jaykishan C., to General Electric Company. Control system. 3,938,941, Cl. 431-80.000.

Patzelt, Helmut, to Daimler-Benz Aktiengesellschaft. Protective installation, especially for the passengers of motor vehicles. 3,938,824, Cl. 280-150.0AB.

Paulson, Donald L.: *See—*
Roberts, Thomas J.; and Paulson, Donald L., 3,938,200.

Payne, Harry R.: *See—*
Camp, Vernon Doyle; and Payne, Harry R., 3,938,700.

Payne, John H.: *See—*
Gardiner, Paul C.; Gardner, Robert S.; Mannal, Clifford; and Payne, John H., 3,938,456.

Paynter, John D.; and Cecil, Richard R., to Exxon Research and Engineering Company. Process for reactivation of iridium-containing catalysts. 3,939,061, Cl. 208-140.000.

Pearce, David, to British Petroleum Chemical International Ltd., The. Xylenes separation process. 3,939,221, Cl. 260-674.0SA.

Pearson, Michael John: *See—*
Nayler, John Herbert Charles; Pearson, Michael John; and Southgate, Robert, 3,939,157.

Peer, John Charles, to RCA Corporation. Class D amplifier. 3,939,380, Cl. 315-397.000.

Peery, Lee H.: *See—*
Maggiolo, Allison, 3,938,955.

Peltret, Pierre Henri, to C.A.V. Limited. Liquid fuel pumping apparatus. 3,938,487, Cl. 123-139.0ST.

Pembleton, James D.; and Pratt, Keith C., to Ford Motor Company. Brake valve for a motor vehicle brake system. 3,938,850, Cl. 303-24.00F.

Pendleton, Robert G.: *See—*
Kaiser, Carl; and Pendleton, Robert G., 3,939,164.

Penfold, Garn Farley; and Redman, Andrew Paul, to Deere & Company. Tree harvester delimbing control. 3,938,566, Cl. 144-2.00Z.

Penn, Lloyd D.: *See—*
Morrow, Robert S.; and Penn, Lloyd D., 3,938,394.

Pennwalt Corporation: *See—*
Bell, Thomas Robert; and Smith, Perrin Gary, 3,939,179.

Pernstich, Konrad, to Siemens Aktiengesellschaft. Nuclear reactor, core vessel intercept construction. 3,939,038, Cl. 176-38.000.

Perry, Edmond S.: *See—*
Jadwin, Thomas A.; Khanna, Ravi; Merrill, Stewart H.; and Perry, Edmond S., 3,938,992.

Perry, L. F., Jr. Portable concrete batch plant. 3,938,673, Cl. 214-2.000.

Perry, Raymond S. B., to Plastic Components, Inc. Roof air vent. 3,938,429, Cl. 98-37.000.

Perry, Roger L., to Gillette Company, The. Disposable blade unit. 3,938,250, Cl. 30-346.570.

Perry, Roger L.: *See—*
Carbonell, Nelson P.; and Perry, Roger L., 3,938,247.

Pescetti, Anthony. Coating composition and therapeutic preparation incorporating same. 3,939,259, Cl. 424-20.000.

Peterson, Janet B.: *See—*
Schmidt, Andreas; Peterson, Janet B.; and Dexter, Martin, 3,939,175.

Petrera, Donato: *See—*
Cavaterra, Enrico; Petrera, Donato; Pignataro, Francesco; and Colucci, Gabriele, 3,939,208.

Petry, Chester H., Jr.; and Hensley, J. Carl, to Byers Photo Equipment. Process of preparing a film strip for handling. 3,939,026, Cl. 156-304.000.

Peyser, Harry A.: *See—*
Patel, Anil U.; DePhillips, James V.; and Peyser, Harry A., 3,938,693.

Peyton, John J., to Industrial Automation Corporation. Gripper means. 3,938,847, Cl. 294-110.00R.

Pfeifer & Langen: *See—*
Schwengers, Dieter, 3,939,281.

Pfeiffer, Robert C.: *See—*
Stephenson, Robert L.; Pfeiffer, Robert C.; and Loomba, Yogendra Singh, 3,938,755.

Pfizer Inc.: *See—*
Abu-El-Haj, Marwan J.; and McFarland, James W., 3,939,174.

Pfleiderer, Ernst: *See—*
Monsheimer, Rolf; and Pfleiderer, Ernst, 3,939,040.

Philbrick, Clayton W.: *See—*
Craven, Truxtun; Crecelius, Carlyle A.; and Philbrick, Clayton W., 3,938,781.

Philipp, Lee D.: *See—*
Billeter, Thomas R.; Philipp, Lee D.; and Schemmel, Richard R., 3,939,406.

Philipp, Warren H.; Marsik, Stanley J.; and May, Charles E., to United States of America, General Counsel-Code GP. Process for making anhydrous metal halides. 3,939,048, Cl. 204-157.10H.

Phillips, Louis H.: *See—*
Brantingham, George L.; Phillips, Louis H.; and Novak, Larry T., 3,939,335.

Phillips Petroleum Company: *See—*
Farfaglia, Silvio T., 3,938,645.
Hogan, John P.; Nasser, Benny E.; and Delap, Joseph A., 3,939,137.
Kinney, Alfred W., 3,938,697.
Needham, Donald G., 3,939,112.
Quigg, Harold T.; and Schirmer, Robert M., 3,938,323.
Walker, Harry L., 3,939,045.

Phlaum, Edward G., to A. O. Smith Corporation. Ignition enhancer for starting pilot burners. 3,938,946, Cl. 431-264.000.

Piccolo, Luigi; Paolinelli, Antonio; and Ghirga, Marcello, to Societa Italiana Resine S.I.R. S.p.A. Process for the purification of titanium tetrachloride. 3,939,244, Cl. 423-76.000.

Pickett, John E. P. Covering apparatus and method for film mounted serial tissue sections. 3,939,019, Cl. 156-57.000.

Pickford, Nigel Evans: *See—*
Deards, Henry Charles; and Pickford, Nigel Evans, 3,938,728.

Pielkenrood, Jacob, to Pielkenrood-Vinitex B.V. Flow regulator for sediment collecting chambers of a separating device. 3,938,713, Cl. 222-486.000.

Pielkenrood-Vinitex B.V.: *See—*
Pielkenrood, Jacob, 3,938,713.

Pignataro, Francesco: *See—*
Cavaterra, Enrico; Petrera, Donato; Pignataro, Francesco; and Colucci, Gabriele, 3,939,208.

Pigney, James Malcolm: *See—*
Hope, Frederick John Charles; and Pigney, James Malcolm, 3,938,849.

Pilkington Brothers Limited: *See—*
Walker, Norman Isaac Webb, 3,938,976.

Pillsbury Company, The: *See—*
Rejsa, Jack J.; and Reid, Francis R., 3,938,301.

Piper, Jack N. Rotary internal combustion engine. 3,938,478, Cl. 123-8.330.

Pitney-Bowes, Inc.: *See—*
Carnes, W. Robert; Balogh, John J., Jr.; and Selnick, Lester L., 3,938,663.
Vijayendran, Bheema R.; and DuBois, R. Clark, 3,939,087.

Plank, Charles J.; and Rosinski, Edward J., to Mobil Oil Corporation. Method for fluid cracking with a composite catalyst. 3,939,058, Cl. 208-120.000.

Plastic Components, Inc.: *See—*
Perry, Raymond S. B., 3,938,429.

Platt International Limited: *See—*
Hooper, Norbert, 3,938,307.

Platt Luggage, Inc.: *See—*
March, Joseph E., 3,938,630.

Plessey Handel und Investments, A.G.: *See—*
Turner, Horace George, 3,938,322.

Pliva, Pharmaceutical and Chemical Works: *See—*
Radobolja, Gorjana; Tamburasev, Zrinka; and Djokic, Slobodan, 3,939,144.

Plumat, Emile, to Glaverbel-Mecaniver. Method and apparatus for vertically drawing a glass ribbon. 3,938,979, Cl. 65-90.000.

Pohjola, Jorma Toivo Tapani. Vehicle steering apparatus. 3,938,607, Cl. 180-9.440.

Polacek, Bohumil; and Marsan, Semen, to Zavody tazkeho strojarstva, generalne riaditelstvo, Martin. Hydrostatic servomechanism with artificial feedback. 3,938,331, Cl. 60-385.000.

Polacheck, James R.; and Hyde, Gilbert F., to Westinghouse Electric Corporation. Shaft seal for a check valve. 3,938,541, Cl. 137-239.000.

Polanco, Julio R. Relator for dental casts. 3,938,252, Cl. 32-32.000.

Polaroid Corporation: *See—*
Scholz, Donald T., 3,938,885.

Polyaninova, Nina Ivanovna: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Koleshikova, Nina Ivanovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,938,951.

Pomella, Piero; and Lauro, Luciano, to Ing. C. Olivetti & C., S.p.A. Numerical control system. 3,939,390, Cl. 318-604.000.

Ponticello, Ignazio S., to Indicon Inc. Polymers of monomers containing active methylene groups and other ethylenically unsaturated monomers. 3,939,130, Cl. 260-65.000.

Pook, Roger: *See—*
Schagen, Pieter; King, Hewson Nicholas Graham; Lamport, Daphne Louise; Pook, Roger; Stubberfield, Pamela May; and Washington, Derek, 3,939,374.

Popoff, Stig Vilhelm: *See—*
Alfred, P. Allan; Rothstein, Sven-Olle H.; and Popoff, Stig Vilhelm, 3,938,651.

Poppe, Willy F., to Serpo. Process for continuous production of thin polyurethane foam layers. 3,939,235, Cl. 264-46.600.

Porret, Daniel, to Ciba-Geigy Corporation. Diglycidylimidazolidones. 3,939,125, Cl. 260-77.50C.

Porter, Charles Norvin: *See—*
MacAskill, Robert Bruce, Jr.; and Porter, Charles Norvin, 3,938,939.

Porter, Lawrence C., to Upjohn Company, The. Method for continuous mixing of foam materials. 3,938,783, Cl. 259-7.000.

Posa-Cut Corporation: *See—*
Rice, Gordon L., 3,938,230.

Positive Safety Manufacturing Company, The: *See—*
Loeser, John K., 3,939,314.

Posokhin, Viktor Vladimirovich: *See—*
Mogilevsky, Vitaly Moritsovich; Ekimov, Vadim Petrovich; Erastov, Alexandr Petrovich; and Posokhin, Viktor Vladimirovich, 3,939,402.

Potvin, Alfred M. Electric grill appliance. 3,938,431, Cl. 99-425.000.

Powell, Alan Leslie: *See—*
Gosling, Cyril Henry; Glick, David; Powell, Alan Leslie; and Murray, William Young, 3,939,298.

Powell, John A.; and Williams, Alan, to Rohm and Haas Company. Barrier resins and impact modifiers therefor. 3,939,223, Cl. 260-876.00R.

Powell, Joseph W.; and Fleck, James N., to Crucible Inc. Method for powder metallurgy compacting. 3,939,241, Cl. 264-111.000.

PowerHold Products, Inc.: *See—*
Manchester, William James, 3,938,816.

PPG Industries, Inc.: *See—*
Anderson, Carl C.; and Marchetti, Joseph R., 3,939,051.
Foster, Robbie T., 3,939,055.
Hummel, Merritt J., 3,938,978.
Pray, Blaine O., 3,938,986.

Pradervand, Michel, to RCA Corporation. Center hole formation in an information storing disc. 3,938,810, Cl. 274-13.00R.

Pratt, Keith C.: *See—*
Pembleton, James D.; and Pratt, Keith C., 3,938,850.

Pray, Blaine O., to PPG Industries, Inc. Herbicide. 3,938,986, Cl. 111-111.000.

Preston, Peter Joseph, to American Cyanamid Company. Packing gland for $TiCl_4$ inlet to oxidizer reactor. 3,938,832, Cl. 285-157.000.

Prestridge, Floyd L.; and Wallace, Harry G., to Combustion Engineering, Inc. System for connecting and disconnecting power source terminals to a load for time proportional to the current drawn by the load. 3,939,395, Cl. 323-4.000.

Preussag Aktiengesellschaft: *See—*
Winnacker, Helmut, 3,939,391.

Price, George. Pipe joining method. 3,938,234, Cl. 29-237.000.

Price, George M., to Frymaster Corporation, The. Control system for frying apparatus. 3,938,498, Cl. 126-374.000.

Price, George McNair: *See—*
Moore, Lewis Frank; and Price, George McNair, 3,938,948.

Price, Harold A.: *See—*
Frisz, James O.; and Price, Harold A., 3,938,449.

Prins, Theodorus. Storage device for liquids. 3,938,341, Cl. 61-46.000.

Probstl, Robert; Reiter, Robert; and Vogelmann, Karl, to Messrs. Sioux Schuhfabriken Peter Sapper. Mocassin-type shoe. 3,938,265, Cl. 36-11.000.

Procter & Gamble Company, The: *See—*
Bennett, Robert A., 3,938,710.
Hau, Thomas J.; and Cherney, Steven D., 3,939,100.

Proeschl, Bernard E.: *See—*
Kershaw, Samuel L.; and Proeschl, Bernard E., 3,938,238.

Pruess, David; and Scannell, James Parnell, to Hoffmann-La Roche Inc. New antibiotic X-1092. 3,939,139, Cl. 260-112.50R.

Pugin, Andre: *See—*
L'Eplattenier, Francois; Pugin, Andre; and Vuitel, Laurent, 3,939,194.

Pullman Incorporated: *See—*
Glasgow, Philip E.; and Gilbert, Nathan, 3,938,960.

Punater, Dinesh Gulabrai, to Harris-Intertype Corporation. Variable speed unwind controller drum. 3,938,437, Cl. 101-228.000.

Purdy, Paul D.: *See—*
Mitchell, James G.; Mitchell, Winalee G.; and Purdy, Paul D., 3,938,210.

Purolator, Inc.: *See—*
Servas, Francis Martin; and Torres, Jorge, 3,939,078.

Putman, Thomas H.; and Osbon, William O., to Westinghouse Electric Corporation. Control valve apparatus. 3,938,538, Cl. 137-39.000.

Pyle, Owen, to Kingsford Company, The. Process for producing solid industrial fuel. 3,938,965, Cl. 44-1.00C.

Qantix Corporation: *See—*
Brown, John, 3,938,876.

Qonaar Corporation: *See—*
Weber, Leonard J.; Dominick, George G.; and Moustafa, Emad T., 3,938,733.

Quarta, Antonio: *See—*
Console, Luciano; Zecchin, Alessandro; and Quarta, Antonio, 3,939,134.

Quasar Electronics Corporation: *See—*
Mueller, David J., 3,939,427.

Quasar Microsystems, Inc.: *See—*
Totino, Peter J., 3,938,758.

Quigg, Harold T.; and Schirmer, Robert M., to Phillips Petroleum Company. Gas turbine combustor with controlled fuel mixing. 3,938,323, Cl. 60-39.650.

Quinn, Ronald E.: *See—*
Hammond, Dean C., Jr.; and Quinn, Ronald E., 3,938,324.

Quoiffy, Harald; and Kuhn, Norbert, to Deere & Company. Combine unloading auger drive. 3,938,684, Cl. 214-521.000.

Rabinovich, Volf Iudovich; Kriger, Jury Nikolaevich; Svitenko, Igor Alexandrovich; and Karpov, Vladimir Alexeevich. Plant for electroslag melting of hollow metal ingots. 3,938,581, Cl. 164-252.000.

Raborn, Eldridge W., to Gordon, Robert A. Motor kill switch with operator attached tether. 3,938,613, Cl. 180-99.000.

Racine, Raymond F.: *See*—
Coleman, Donald D.; and Racine, Raymond F., 3,939,474.

Rader, Robert R., to Wirtz Manufacturing Company, Inc. Grid ejection mechanism for a battery grid casting machine. 3,938,585, Cl. 164-347.000.

Radermacher, Gunter; and Busch, Karl Alexander, to Interatom, Internationale Atomreaktorbau GmbH. Vibration damping device, especially for protecting pipelines from earthquakes. 3,938,625, Cl. 188-1.00B.

Radiation Limited: *See*—
Engelbert, Harald, 3,938,935.
Robertson, Robert; and Read, Reginald Arthur, 3,939,295.

Radobolja, Gorjana; Tamburasev, Zrinka; and Djokic, Slobodan, to Pliva, Pharmaceutical and Chemical Works. Manufacture of N-(benzenesulfonyl)-5-O-desosaminyl-erythromycilamine derivatives. 3,939,144, Cl. 260-210.00E.

Radowicz, Richard D. End jointed beam and laminated beam adhesive application system and head for use therein. 3,938,467, Cl. 118-2.000.

Ragard, Phillip Anthony; and Young, Keith Alan, to Universal Instruments Corporation. Wrapping post swaging apparatus. 3,938,364, Cl. 72-403.000.

Ralph M. Parsons Company, The: *See*—
White, Gerald A.; and Roszkowski, Theodore R., 3,938,968.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Metal salts of hindered piperidine carboxylic acids and stabilized compositions. 3,939,163, Cl. 260-270.00C.

Ramirez, Juan A. Magnetically actuated reciprocating engine. 3,939,367, Cl. 310-20.000.

Randall, David I.; and Wynn, Robert W., to GAF Corporation. Composition containing an aliphatic N-cycloalkyl-p-(2-chloroethyl)-phosphonamidate. 3,938,983, Cl. 71-86.000.

Randell, Donald Richard; and Smith, Malcolm John, to Ciba-Geigy Corporation. Dehydro pyridinyl sulfides, sulfoxides and sulfones. 3,939,170, Cl. 260-294.80F.

Randolph, Allan E., Sr.: *See*—
Stevens, Harry G.; and Randolph, Allan E., Sr., 3,938,794.

Raque, Glen F., to FMC Corporation. Article feeding system. 3,938,647, Cl. 198-31.0AA.

Rasmussen, Gunnar Olaf Vestergaard, to Havera Development Ltd. Power transmitting mechanism. 3,938,397, Cl. 74-60.000.

Ratajczyk, James Daniel; Stein, Robert George; and Swett, Leo Ralph, to Abbott Laboratories. 1,3-Dimethyl- 1H-pyrazolo(4,3-D) pyrimidine-7 (6H)-ones. 3,939,161, Cl. 260-256.40F.

Ratner, Buddy D.; and Hoffman, Allan S., to United States of America, Energy Research and Development Administration. Process for radiation grafting hydrogels onto organic polymeric substrates. 3,939,049, Cl. 204-159.130.

Raufeisen, Robert: *See*—
Salzgeber, Daniel; Raufeisen, Robert; and Davis, Charles W., 3,938,911.

Rausch, Richard E., to Universal Oil Products Company. Dehydrogenation method and multimetallic catalytic composite for use therein. 3,939,220, Cl. 260-668.00D.

Raw, Peter Michael; and Llewellyn, Rees Jenkin, to British Insulated Callender's Cables Limited. Aluminium alloy conductor wire. 3,939,299, Cl. 174-23.00R.

Raymond International, Inc.: *See*—
Swenson, William J., 3,938,595.

Raymond, James W.: *See*—
Millett, James A.; and Raymond, James W., 3,938,359.

Raymond Lee Organization, Inc., The: *See*—
Burrell, Julius W., 3,938,264.
Butler, Robert C., 3,938,690.
Collier, William S., 3,938,839.
Crissman, Jay W., 3,938,466.
Giammalvo, Nicholas A., 3,939,338.
Hynes, Charles P., 3,938,229.
Kareman, James, 3,938,251.
Kella, Harry Y., 3,938,389.
Martin, William F., 3,938,819.

Raytheon Company: *See*—
Bickford, William J., 3,939,407.
Groginsky, Herbert L., 3,939,472.
Helton, Robert A.; Walsh, George M.; and Alarie, Allan P., 3,939,465.

RCA Corporation: *See*—
D'Amato, Ralph James, 3,939,447.
Larrabee, Robert Dean, 3,939,098.
Peer, John Charles, 3,939,380.
Pradervand, Michel, 3,938,810.
Sussman, Alan, 3,938,242.

Read, Reginald Arthur: *See*—
Robertson, Robert; and Read, Reginald Arthur, 3,939,295.

Reash, Clair W., to Union Carbide Corporation. Alignment spring counteracting antenna type getter effect on electron gun alignment. 3,939,376, Cl. 313-451.000.

Redford, David A.; and Mitchell, David L., to Texaco Exploration Canada Ltd. Method for recovering viscous asphaltic or bituminous petroleum. 3,938,590, Cl. 166-270.000.

Redman, Andrew Paul: *See*—
Penfold, Garn Farley; and Redman, Andrew Paul, 3,938,566.

Redman, Charles M., to United States of America, Army. Wavefront flattener. 3,939,479, Cl. 343-753.000.

Redmond, Stephen L.: *See*—
Anderson, Matthew E.; Redmond, Stephen L.; Horky, John W.; and Krolak, Leo V., 3,938,438.

Reed, Stuart, to Amchem Products, Inc. Aqueous zinc phosphating solution and method of rapid coating of steel for deforming. 3,939,014, Cl. 148-6.15Z.

Reed, Thomas G., Jr. Process for treating oil shale. 3,939,057, Cl. 208-11.000.

Rees, Herbert, to Husky Injection Molding Systems Limited. Pairing and stacking system for molded articles. 3,938,675, Cl. 214-6.00M.

Regie Nationale des Usines Renault: *See*—
Boudeville, Jean-Claude; and Gelin, Jacques, 3,938,612.
Roubinet, Pierre, 3,938,288.

Reid, Francis R.: *See*—
Rejsa, Jack J.; and Reid, Francis R., 3,938,301.

Reif, Werner: *See*—
Koenig, Horst; Metzger, Horst; and Reif, Werner, 3,939,184.

Reiland, William H.: *See*—
Williams, Edward S.; Reiland, William H.; and Griffith, John Q., III, 3,939,082.

Rein, Richard H.: *See*—
Meehan, Richard J., deceased; Rein, Richard H.; and Willgohs, Ralph H., 3,939,323.

Reinhold, Herbert E., Jr.: *See*—
Sarnoff, Stanley J.; Reinhold, Herbert E., Jr.; and Wolfe, Allan M., 3,938,507.

Reissmuller, Anton. Device for post-atomization for combustion engines using a compressed mixture and an external ignition. 3,938,967, Cl. 48-180.00R.

Reiter, Robert: *See*—
Probstl, Robert; Reiter, Robert; and Vogelmann, Karl, 3,938,265.

Reitknecht, Jack. Swab applicator with adapter chuck and closure. 3,938,898, Cl. 401-183.000.

Rejsa, Jack J.; and Reid, Francis R., to Pillsbury Company, The. Apparatus for inserting separator plates in cans and tamping them in place. 3,938,301, Cl. 53-157.000.

Reliance Electric Company: *See*—
Williams, Roger B., Jr.; and Loshbough, Richard C., 3,939,332.

Remond, Pierre, to Saurer-Diederichs S.A. Scissor-type shear for loom. 3,938,414, Cl. 83-368.000.

Rennie, Robert Allan Campbell, to Imperial Chemical Industries Limited. Oxidation of aromatic compounds with a tetravalent lead oxidation system. 3,939,214, Cl. 260-621.00G.

Repke, Virginia L., to Johnson & Johnson. Disposable diaper. 3,938,522, Cl. 128-287.000.

Republic Packaging Corporation: *See*—
Carmody, John Maurice, 3,938,661.

Reynolds, George A.; Van Allan, James A.; and Contois, Lawrence E., to Eastman Kodak Company. Pyrylium dyes for electrophotographic composition and element. 3,938,994, Cl. 96-1.600.

Rhee, Chongkook John: *See*—
George, William Lloyd; Hays, Robert Guy; and Rhee, Chongkook John, 3,938,241.

Rheinmetall GmbH: *See*—
Nordmann, Adolf, 3,938,421.

Rhone-Poulenc Industries: *See*—
Michel, Max; and Dupuy, Georges, 3,939,250.

Rhone-Poulenc-Textile: *See*—
Gaudard, Yves, 3,938,339.
Granger, Alain; and Sausse, Andre, 3,939,069.

Rhudy, John S.; and Knight, Bruce L., to Marathon Oil Company. Fracturing fluid. 3,938,594, Cl. 166-308.000.

Ribes, Andre Auguste, to Centre National d'Etudes Spatiales. Decommutator for extracting zero and one bits from a coded message of duration-modulated pulses. 3,939,304, Cl. 178-68.000.

Rice, Charles M., to Akzona Incorporated. Yarn stop-motion device. 3,938,311, Cl. 57-87.000.

Rice, Gordon L., to Posa-Cut Corporation. Cutting tool. 3,938,230, Cl. 29-96.000.

Rice, Richard C.: *See*—
Horn, Barry N.; Swain, Richard S.; and Rice, Richard C., 3,939,460.

Richard, Wilton. Automatic scullery system. 3,938,533, Cl. 134-63.000.

Richards, Raymond E. Metallurgical cooling panel. 3,938,789, Cl. 266-16.000.

Richards, Stanzer. Door structure employing an auxiliary door. 3,938,577, Cl. 160-90.000.

Richardson, James Kipling: *See*—
Schmauder, Johnnie Everett; and Richardson, James Kipling, 3,939,378.

Richardson, Jerry G.: *See*—
Abella, Richard M.; Dodson, Keith D.; and Richardson, Jerry G., 3,938,924.

Richardson, Peter C., to Celanese Corporation. Supported catalyst for acrolein oxidation. 3,939,096, Cl. 252-456.000.

Richmond, Albert R.; and Appleman, William S., to Richmond Manufacturing Company, The. Portable earth boring machine. 3,938,597, Cl. 175-24.000.

Richmond Manufacturing Company, The: *See*—
Richmond, Albert R.; and Appleman, William S., 3,938,597.

Richter Gedeon Vegyeszeti Gyar Rt: *See—*
Ormos, Zoltan; Csukas, Bela; Stefko, Bela; Pataki, Karoly; Blickle, Tibor; and Felmeri, Jozsef, 3,938,259.

Richter, Hans, to Siemens Aktiengesellschaft. Counter for measuring apparatus such as a water meter or the like. 3,938,737, Cl. 235-131.00R.

Rickert, Glenn E. Ventilating and/or cooling dehumidifier. 3,938,348, Cl. 62-97.000.

Ricketts, Ronald Edmund, to Imperial Chemical Industries Limited. Manufacture of non-woven materials. 3,938,221, Cl. 19-155.000.

Riedel, Hans J.; and Spellman, Vernon C., to Optical Coating Laboratory, Inc. Level control apparatus and method for cryogenic liquids. 3,938,347, Cl. 62-55.000.

Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Large converter arrangement. 3,938,855, Cl. 308-6.00R.

Riehl, Fred, to Robertshaw Controls Company. Electric ignition assembly. 3,938,944, Cl. 431-191.000.

Riehl, Fred, to Robertshaw Controls Company. Burner construction and method of making the same. 3,938,945, Cl. 431-191.000.

Riley, Leon H. Depositing optical fibers. 3,939,052, Cl. 204-192.000.

Ringspann Albrecht Maurer K.G.: *See—*
Giese, Emil; and Maurer, Ruprecht, 3,938,632.

Rioux, Jacques E.; Turp, Gerald; and Jacques, Francois, to Centre de Recherche Industrielle de Quebec. Instrument for laparoscopic tubal cauterization. 3,938,527, Cl. 128-303.170.

Risberg, Sture; Lindgren, Alf; Rixon, Kjell; Wallden, Rickard; and Brundin, Bengt, to Risberg, Sture. Debugging arrangement. 3,939,420, Cl. 325-67.000.

Ritota, Michael C.; and Mancini, L. Phillip, to M.E.D.S. Corporation. Collecting bag. 3,938,521, Cl. 128-283.000.

Rixon, Kjell: *See—*
Risberg, Sture; Lindgren, Alf; Rixon, Kjell; Wallden, Rickard; and Brundin, Bengt, 3,939,420.

Robert Bosch G.m.b.H.: *See—*
Jansen, Helmut; and Vollmer, Klaus, 3,938,305.

Roberts, James K., to Bendix Corporation, The. Fixed gap speed sensor. 3,939,373, Cl. 310-168.000.

Roberts, John S., to Kling-Tecs, Inc. Apparatus for crimping yarn. 3,938,226, Cl. 28-1.700.

Roberts, Robert E., to Under Sea Industries Of Delaware, Inc. Mouthpiece regulator for an underwater breathing apparatus. 3,938,511, Cl. 128-142.200.

Roberts, Thomas J.; and Paulson, Donald L., to Borg-Warner Corporation. Contamination prevention system for bathtub. 3,938,200, Cl. 4-173.00R.

Robertshaw Controls Company: *See—*
Bauer, Frederick T., 3,938,940.
Bolha, John J., 3,938,542.
Riehl, Fred, 3,938,944.
Riehl, Fred, 3,938,945.

Robertson, Neil George Douglas, to Wiggins Teape Research & Development Limited. Apparatus for producing a foamed fibre dispersion. 3,938,782, Cl. 259-4.00R.

Robertson, Robert; and Read, Reginald Arthur, to Radiation Limited. Protective coatings and frits therefor. 3,939,295, Cl. 428-539.000.

Robin Products Company: *See—*
Ruhl, Edward A., 3,938,842.

Robinson, George Dennis, Jr.; and Hartsell, Hal Craig, Jr., to Gilbert & Barker Manufacturing Company. Fluid dispensing nozzle including trigger retaining mechanism. 3,938,565, Cl. 141-392.000.

Roccaforte, Harry L., to Hoerner Waldorf Corporation. Dispensing carton for nestable cups. 3,938,703, Cl. 221-305.000.

Roces, Rafael Tuti. Hydraulic coupling mechanism. 3,938,332, Cl. 60-536.000.

Roch, Jacques Leon, to Electroglas, Inc. Micro-circuit test apparatus. 3,939,414, Cl. 324-158.00F.

Roch, Josef: *See—*
Nickl, Josef; Muller, Erich; Narr, Berthold; and Roch, Josef, 3,939,268.

Rock, Erich; and Mages, Bernhard, to Blum Gesellschaft m.b.H. Hinge mounting device. 3,938,219, Cl. 16-130.000.

Rockwell International Corporation: *See—*
Coleman, Donald D.; and Racine, Raymond F., 3,939,474.
Molina, Orlando G., 3,939,092.
Molina, Orlando G., 3,939,101.

Rodrigues Associates, Inc.: *See—*
Rodrigues, John J., 3,938,392.

Rodrigues, John J., to Rodrigues Associates, Inc. Pipette. 3,938,392, Cl. 73-425.600.

Roecklein, Robert G.: *See—*
Orwig, David F.; and Roecklein, Robert G., 3,939,287.

Rohde, William A., to Tower Products, Inc. Sterile pouch. 3,938,658, Cl. 206-439.000.

Rohm GmbH: *See—*
Monsheimer, Rolf; and Pfleiderer, Ernst, 3,939,040.

Rohm, Gunter Horst. Chuck for impact-type drill. 3,938,817, Cl. 279-61.000.

Rohm and Haas Company: *See—*
Emmons, William D.; and Levy, Jerome F., 3,939,200.
Powell, John A.; and Williams, Alan, 3,939,223.

Rohrer, George A., to Technovation, Inc. Process for stable phase III potassium nitrate and articles prepared therefrom. 3,939,292, Cl. 427-55.000.

Rollins, Thomas J.: *See—*
Cannalte, Gary A.; Crouse, Richard J.; Koenig, Richard D.; Rollins, Thomas J.; and Walker, Donald L., 3,939,417.

Rollmann, Louis D., to Mobil Oil Corporation. Manufacture of crystalline aluminosilicate zeolites. 3,939,246, Cl. 423-118.000.

Romolt, Abraham, to Master Specialty Products. Removable stiffener for spectacle cases. 3,938,655, Cl. 206-5.000.

Roodvoets, Mark R., to Firestone Tire & Rubber Company, The. Synergistic peroxide cures for high vinyl rubbers. 3,939,133, Cl. 260-85.100.

Rooij, Karel Petrus Van: *See—*
Lohn, Klaus; Lutteke, Georg; Schiefer, Gerd; Bruntink, Lammert; Groenewegen, Paulus Petrus Maria; Weinerth, Hans Viktor; Zwijsen, Wilhelmus Antonius Joseph Marie; and Rooij, Karel Petrus Van, 3,939,429.

Rosauer, Peter J., to Magnaflux Corporation. Automatic locking radioisotope camera lock. 3,939,355, Cl. 250-497.000.

Rosenberg, Peretz. Regulated fluid tap particularly useful as water trickler nozzle. 3,938,552, Cl. 137-624.140.

Rosenberg, Richard C.: *See—*
DeHart, Arnold O.; Rosenberg, Richard C.; and Trachman, Edward G., 3,939,081.

Rosenberger, Gerhard: *See—*
Hermstein, Wolfgang; Rosenberger, Gerhard; and Muller, Willi, 3,939,412.

Rosenthal, Claude Roland Julius, to Uniflam, Societe Anonyme, Societe Universelle des Flammes. Device for feeding an expanded gaseous fuel to a burner nozzle for instance of a lighter and lighter such as a cigarette lighter provided with such a device. 3,938,947, Cl. 431-344.000.

Rosenthal, Robert: *See—*
Van Lenten, Constance; Rosenthal, Robert; and Sperry, Elmer A., III, 3,939,401.

Rosinger, Sigurd: *See—*
Kleiner, Hans-Jerg; and Rosinger, Sigurd, 3,939,050.

Rosinski, Edward J.: *See—*
Plank, Charles J.; and Rosinski, Edward J., 3,939,058.

Ross, Thorvald S., Jr.; and Entin, Leonard P., to Ross, Thorvald S., Jr. Receptacle for waste material. 3,938,731, Cl. 229-54.00R.

Rosvold, Warren C., to Signetics Corporation. Schottky barrier diode semiconductor structure and method. 3,938,243, Cl. 29-578.000.

Roszkowski, Theodore R.: *See—*
White, Gerald A.; and Roszkowski, Theodore R., 3,938,968.

Roth, Albert; and Holma, Gary M., to United States of America, Navy. Closest point of approach calculator. 3,939,334, Cl. 235-156.000.

Roth, Hanspeter, to "Swissair" Schweizerische Luftverkehr-AG. Method and installation for the treatment of waste water to form useful water. 3,939,070, Cl. 210-23.00H.

Rothstein, Sven-Olle H.: *See—*
Alfred, P. Allan; Rothstein, Sven-Olle H.; and Popoff, Stig Vilhelm, 3,938,651.

Roubinet, Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Reinforcing device for automobile body. 3,938,288, Cl. 52-615.000.

Routh, Claude C., to United States of America, Navy. Dopplerizing a signal of varying frequency. 3,939,462, Cl. 340-3.00E.

Rouverol, William S. Cageless roller bearing. 3,938,865, Cl. 308-205.000.

Rovan, Joseph W.: *See—*
Grimes, James E.; and Rovan, Joseph W., 3,939,362.

Rowe, Carroll Grant. Self-loading hay hauler. 3,938,682, Cl. 214-353.000.

Rowley, Donald A.: *See—*
Dye, Richard A.; and Rowley, Donald A., 3,938,262.

Royka, Stephen F.; and Martin, Robert G., to Xerox Corporation. Xerographic method for making a responsive answer system. 3,938,993, Cl. 96-1.400.

Rubin, Alan B.: *See—*
Garrett, Charles B., Sr.; Garrett, Roger L.; and Rubin, Alan B., 3,939,285.

Ruder, Nils Inge Algot. Sight for use on hand firearms and a method of using it. 3,938,875, Cl. 350-10.000.

Rudner, Bernard: *See—*
DiBella, Eugene P.; and Rudner, Bernard, 3,939,124.

Rudolph, Karl-Heinz: *See—*
Lucking, Hans Joachim; Seyfried, Klaus; Buchner, Werner; and Rudolph, Karl-Heinz, 3,939,195.

Ruff, Stanley. Drink-through slosh-inhibiting closure lids for potable open-top containers. 3,938,695, Cl. 220-90.400.

Ruhl, Edward A., to Robin Products Company. Bumper guard assembly. 3,938,842, Cl. 293-71.00R.

Rumble, Clive St. John. Display units. 3,938,665, Cl. 211-4.000.

Rumyantsev, Vladimir Georgievich: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Koleshikova, Nina Ivanovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,938,951.

Rundell, Herbert A.; and Hall, Russell W., Jr., to Texaco Inc. Sensitive deep-well-drilling hook load measuring system. 3,938,381, Cl. 73-143.000.

Rusakova, Nina Trofimovna: *See—*
Motov, David Lazarevich; Konstantinov, Vladimir Ivanovich; Rumyantsev, Vladimir Georgievich; Belokoskov, Valentin Ivanovich; Ude, Eduard Osvaldovich; Babkin, Artur Grigorievich; Metelkin, Alexandr Ivanovich; Suchkov, Vasily Georgievich; Koleshikova, Nina Ivanovna; Motovilin, Alexandr Vasilievich; Rusakova, Nina Trofimovna; Nikonova, Tatyana Vladimirovna; Polyaninova, Nina Ivanovna; Sinenko, Mikhail Grigorievich; Krylova, Irina Fedorovna; and Yakutin, Vladimir Mikhailovich, 3,938,951.

Ruske, Manfred: *See—*
Elser, Wolfgang; and Ruske, Manfred, 3,939,162.

Ryan, Jay Edward, to American Hospital Supply Corporation. Covered serving tray. 3,938,688, Cl. 220-23.800.

Ryan, Ralph L.: *See—*
Taitel, Charles M.; and Ryan, Ralph L., 3,939,032.

Ryugo, Noboru; Inaniwa, Keizo; and Sugiyama, Akira, to Hitachi, Ltd. Process for depositing the deposition agent on the surface of a number of semiconductor substrates. 3,939,017, Cl. 148-189.000.

S.A.R.L. Publigam: *See—*
Torassa, Jean Francois, 3,938,942.

S.T. Dupont: *See—*
Malamoud, Jean Gaston, 3,938,943.

Saad, Theodore S., to Micro-Tronics, Inc. Beam stirrer. 3,939,320, Cl. 219-10.55F.

Sacht, Hans Otto; Honhold, Joost; and Elert, Uwe, to Gebrueder Welger. Feeder rake with an overload protection device for agricultural pick-up and other balers. 3,938,652, Cl. 198-223.000.

Sada, Tetsuo: *See—*
Nakamura, Takao; Hirose, Itsuo; Misawa, Rokuro; Horii, Hidenori; Hagio, Akira; and Sada, Tetsuo, 3,938,724.

St. John, Douglas F., to Owens-Illinois, Inc. Method for removing gaseous inclusions from molten glass. 3,938,981, Cl. 65-134.000.

St. Regis Paper Company: *See—*
Smith, Donald Ferrand, 3,938,729.

Saito, Makoto: *See—*
Sakamoto, Masakatsu; Uchida, Kenji; Saito, Makoto; Yamada, Yasunori; and Takenaka, Yoshiyuki, 3,938,912.

Sakamoto, Masakatsu; Uchida, Kenji; Saito, Makoto; Yamada, Yasunori; and Takenaka, Yoshiyuki, to Hitachi, Ltd.; Showa Denko K.K.; and Hitachi Sanki Engineering Co., Ltd. Horizontal type hydrohoist. 3,938,912, Cl. 417-339.000.

Sakuma, Kei. Golf accessory. 3,938,805, Cl. 273-32.00A.

Sakurai, Yasuhiko: *See—*
Arai, Hiroshi; Ohta, Jun; Taniguchi, Koichi; Sakurai, Yasuhiko; and Ohtake, Toshikazu, 3,939,470.

Sallerup, Hans Erik: *See—*
Mogensen, Rasmus Langballe; and Sallerup, Hans Erik, 3,938,393.

Salmans, Dean R.: *See—*
Sly, Eugene L.; and Salmans, Dean R., 3,938,602.

Salts, Thomas R., to Crowe-Gulde, Inc. Method for manufacture of facing bricks with sharply delineated portions of different color and texture. 3,939,238, Cl. 264-71.000.

Salzgeber, Daniel; Raufeisen, Robert; and Davis, Charles W., to Stanadyne, Inc. Fuel injection pump with metering valve controlled cooling. 3,938,911, Cl. 417-252.000.

Sampsell, Jack W.: *See—*
Kelly, Neil C.; McFarland, Robert L.; and Sampsell, Jack W., 3,939,463.

Samuels, W. Edward. Cryogenic controller device. 3,938,554, Cl. 137-625.610.

Sandoz Ltd., (Sandoz AG): *See—*
Bolton, Ivan Joseph; Fleck, Fritz; and Mercer, Alec Victor, 3,939,154.

Santini, Danilo J. Visual display device. 3,938,270, Cl. 40-130.00K.

Santomieri, Louis S. Catheter. 3,938,530, Cl. 128-349.00R.

Sanyo Onkyo Seiki Co. Ltd.: *See—*
Nakamori, Yasuo, 3,938,278.

Saperov, Evgeny Valentinovich: *See—*
Aladiev, Ivan Timofeevich; Voskresensky, Kirill Dmitrievich; Gukov, Gennady Petrovich; Saperov, Evgeny Valentinovich; and Fardzinov, Valery Kombolatovich, 3,938,592.

Sargunar, John E., to Burroughs Corporation. Tape transport system including a logical network for producing quadrature pulse trains and motor control utilizing same. 3,938,757, Cl. 242-186.000.

Sarich, Tony Ralph. Gas seal for vane type internal combustion engine. 3,938,916, Cl. 418-137.000.

Sarma, Krishna R. K.: *See—*
Wrenn, George T., Jr.; Mann, Hugh W.; and Sarma, Krishna R. K., 3,938,353.

Sarnoff, Stanley J.; Reinhold, Herbert E., Jr.; and Wolfe, Allan M., to Survival Technology Incorporated. Portable heart monitor. 3,938,507, Cl. 128-2.06B.

Sarofeen, George M. J. Mold assembly for casting synthetic lenses. 3,938,775, Cl. 249-102.000.

Sato, Kazuo: *See—*
Morikawa, Hiroyuki; Sugimoto, Tosio; and Sato, Kazuo, 3,939,131.

Sato, Kuniaki; Toyama, Kozo; Matsushita, Eiji; Tomita, Akio; and Suzuki, Shuei, to Kajima Corporation. Fittings for connecting columns and beams of steel frame construction. 3,938,297, Cl. 52-758.00F.

Sato, Kunito; and Hegarty, Gerald R., to Armour and Company. Inhibition of warmed-over flavor in meats. 3,939,288, Cl. 426-332.000.

Sato, Mitsuo: *See—*
Hayashi, Yoshikazu; and Sato, Mitsuo, 3,939,313.

Sato, Seiji: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 3,939,043.

Sato, Tomoyasu: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 3,939,043.

Satoh, Ryosuke: *See—*
Fujiwhara, Mitsuto; Satoh, Ryosuke; Masukawa, Toyoaki; and Uozumi, Takahiro, 3,938,996.

Saurer-Diederichs S.A.: *See—*
Remond, Pierre, 3,938,414.

Sausse, Andre: *See—*
Granger, Alain; and Sausse, Andre, 3,939,069.

Savard, Guy: *See—*
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; Savard, Guy; and Lee, Robert, 3,938,790.

Saveker, James A. Plural load lighting assembly energizable through two input terminals. 3,939,358, Cl. 307-22.000.

Savich, Peter P., to Scott Paper Company. Method for forming fibrous pads. 3,939,240, Cl. 264-91.000.

Savin Business Machines Corporation: *See—*
Smith, Ian Edward; Hastwell, Peter John; and Vermeulen, Marinus Cornelus, 3,939,085.

Sayer, Wayne L. Method and apparatus for detecting the thermal characteristics of a subsurface formation in situ. 3,938,383, Cl. 73-154.000.

Sayles, David C., to United States of America, Army. Solid propellant containing organic perchlorate salt as burning rate accelerator. 3,939,018, Cl. 149-19.100.

Scannell, James Parnell: *See—*
Pruess, David; and Scannell, James Parnell, 3,939,139.

Scans Associates, Inc.: *See—*
Converse, Vernon G., III; Cline, Edwin L.; and Tinkham, Leland P., 3,938,377.
Maisonville, Richard C., 3,939,397.

Scenic Flying Limited: *See—*
Hempenstall, John, 3,938,761.

Schagen, Pieter; King, Hewson Nicholas Graham; Lamport, Daphne Louise; Pook, Roger; Stubberfield, Pamela May; and Washington, Derek, to U.S. Philips Corporation. Electron multipliers having tapered channels. 3,939,374, Cl. 313-95.000.

Schagen, Pieter; King, Hewson Nicholas Graham; and Washington, Derek, to U.S. Philips Corporation. Cathode ray tube having channel multiplier and electron reflecting system for energizing color phosphor strips. 3,939,375, Cl. 313-408.000.

Scharf, Daniel J., to Hooker Chemicals & Plastics Corporation. Phosphonomethyl compounds. 3,939,226, Cl. 260-932.000.

Schat, Hermannus: *See—*
Adam, Fritz Guenter; and Schat, Hermannus, 3,939,364.

Scheffel, Walter. Device for drawing off weft thread. 3,938,561, Cl. 139-122.00H.

Scheij, Hans: *See—*
Kroeze, Hendrik J.; and Scheij, Hans, 3,938,674.

Scheinppflug: *See—*
Kuhle, Engelbert; Klauke, Erich; Kaspers, Helmut; and Scheinppflug, 3,939,189.

Schemmel, Richard R.: *See—*
Billeter, Thomas R.; Philipp, Lee D.; and Schemmel, Richard R., 3,939,406.

Schering Aktiengesellschaft: *See—*
Buttermann, Gotz, 3,939,204.
Lachnit-Fixson, Ursula, 3,939,264.
Lehmann, Hans-Gunter, 3,939,187.

Schertz, Charles J., to United States of America, Army. Recoil operated firearm with unitary barrel and breech bolt lock member. 3,938,423, Cl. 89-176.000.

Schiefer, Gerd: *See—*
Lohn, Klaus; Lutteke, Georg; Schiefer, Gerd; Bruntink, Lammert; Groenewegen, Paulus Petrus Maria; Weinerth, Hans Viktor; Zwijsen, Wilhelmus Antonius Joseph Marie; and Rooij, Karel Petrus Van, 3,939,429.

Schiffarth, Josef; Lorkin, Clive Graham; and Fletcher, Kenneth John, to Foseco International Limited. Protection of carbon articles. 3,939,028, Cl. 156-306.000.

Schinke, Friedel: *See—*
Maier, Eckhard; Ostermeier, Heinrich; Kormendi, Kalman; and Schinke, Friedel, 3,938,687.

Schirmer, Robert M.: *See—*
Quigg, Harold T.; and Schirmer, Robert M., 3,938,323.

Schlage, Ernest L., to Schlage Lock Company. Electric switch contained within lock frame and actuated by movement of locking bar. 3,939,315, Cl. 200-61.640.

Schlage Lock Company: *See—*
Schlage, Ernest L., 3,939,315.

Schlomach, Eckart: *See—*
Brinkmann, Heinz; Gersbeck, Rolf; and Schlomach, Eckart, 3,938,927.

Schlosser, Steven M.: *See—*
Fineman, Howard E.; Schlosser, Steven M.; Hill, Lawrence M.; and Hanson, Richard E., 3,938,378.

Schmauder, Johnnie Everett; and Richardson, James Kipling, to Tektronix, Inc. Storage cathode ray tube having auxiliary coils to correct non-symmetrical geometry. 3,939,378, Cl. 315-12.00R.

Schmid, Frederick: *See—*
McCauley, James W.; Viechnicki, Dennis J.; and Schmid, Frederick, 3,939,003.

Schmidt, A. Carl, to Weil-McLain Company, Inc. Water to air heat pump employing an energy and condensate conservation system. 3,938,352, Cl. 62-279.000.

Schmidt, Andreas; Peterson, Janet B.; and Dexter, Martin, to Ciba-Geigy Corporation. Hydroxyphenylated hydantoins. 3,939,175, Cl. 260-309.500.

Schmidt, Hans-Joachim: *See—*
Fernholz, Hans; Wunder, Friedrich; and Schmidt, Hans-Joachim, 3,939,199.

Schmidt, Jurgen: *See—*
Victor, Hans R.; and Schmidt, Jurgen, 3,938,863.

Schmidt, Manfred: *See—*
Riegler, Ernst; and Schmidt, Manfred, 3,938,855.

Schmidt, Otto: *See—*
Diepers, Heinrich; and Schmidt, Otto, 3,939,053.

Schmidt, Richard, to United States of America, Navy. Beryllium reinforced composite solid and hollow shafting. 3,938,964, Cl. 29-191.400.

Schmit, Justin M., to Arctic Pac, Inc. Fluid containing and dispersing structure. 3,938,707, Cl. 222-83.500.

Schmitz, Joseph F.; Malz, Ute K.; and Nordeen, Erwin, to Whirlpool Corporation. Handle mounting means for power driven vacuum cleaner. 3,938,216, Cl. 15-340.000.

Schollenberger, Charles S.; and Dinbergs, Kornelius, to B. F. Goodrich Company, The. Stable polyurethane solutions. 3,939,111, Cl. 260-32.6NR.

Scholz, Donald T., to Polaroid Corporation. Multipurpose audio-visual cassette system. 3,938,885, Cl. 352-78.00R.

Schrimper, Vernon L.; Lillig, Floyd A.; and Ulch, Darrell J., to Iowa Manufacturing Company. Adjustment means for roll crushers with gas hydraulic springs. 3,938,732, Cl. 241-231.000.

Schrock, Wilfried: *See—*
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Schroder, Rolf: *See—*
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Schudel, Peter: *See—*
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Schultz, Ward E.; and Smith, Harry D., Jr., to Texaco Inc. Pulsed neutron logging system for inelastic scattering gamma rays with gain compensation. 3,939,343, Cl. 250-262.000.

Schulz, Johann G. D.: *See—*
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Schumacher, Ernest W., to Virginia Chemicals, Inc. Combination liquid trapping suction accumulator and evaporator pressure regulator device including a cartridge type expansion valve. 3,938,351, Cl. 62-217.000.

Schurger, Rainer; Walter, Lothar; and Burkl, Erich, to SKF Industrial Trading & Development Company, B.V. Fluid bearing system. 3,938,862, Cl. 308-9.000.

Schusberger, Meyer: *See—*
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Schwartz-Domke, Wolfgang; Grof, Helmut; and Wamser, Anton, to Leybold Heraeus GmbH & Co. KG. Arrangement for continuous manufacture of metal ingots in a mold with open bottom. 3,938,582, Cl. 164-252.000.

Schwarzler, Hans-Jurgen: *See—*
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Schwengers, Dieter, to Pfeifer & Langen. Extraction of fat from starch-containing vegetable matter. 3,939,281, Cl. 426-11.000.

Scislowicz, Henry; and Frazier, Thomas A., to Abbott Laboratories. Transfer unit having a dual channel transfer member. 3,938,520, Cl. 128-272.300.

SCM Corporation: *See—*
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Scott Paper Company: *See—*
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Seaquist Valve Company: *See—*
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Sebenik, Roger Frank; and Lippman, Alfred, to Toth Aluminum Corporation. Purification of aluminum chloride. 3,938,969, Cl. 55-71.000.

Seglem, Clifford E.: *See—*
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Seibert, Kenneth T., to Straight Line Filters, Inc. Horizontal vacuum belt filter machine. 3,939,077, Cl. 210-401.000.

Seith, Robert T.: *See—*
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Seitz, Robert F.; Fritz, William E.; and Madland, Thorvald, to Youngstown Steel Door Co., The. Door assemblies for closing rail car end openings. 3,938,446, Cl. 105-368.00R.

Seki, Katumi; Kawara, Masaru; and Tachi, Yasuo, to Hitachi, Ltd. Reactor core clamping device. 3,939,039, Cl. 176-87.000.

Selas Corporation of America: *See—*
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Selgin, Paul J., to Neotec Corporation. Image colorimeter. 3,938,896, Cl. 356-179.000.

Selnick, Lester L.: *See—*
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Servas, Francis Martin; and Torres, Jorge, to Johnson & Johnson; and Purolator, Inc. Extracorporeal filter. 3,939,078, Cl. 210-436.000.

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Shaver, David M.; and Gauthier, John A., to GTE Automatic Electric (Canada) Limited. Electronic side of line detector. 3,939,308, Cl. 179-17.00A.

Sheehan, John C., to Massachusetts Institute of Technology. Displacement of the thiazolidine ring in penicillin with the formation of a biologically active cephem system. 3,939,151, Cl. 260-243.00C.

Shelby, Robert L.; and Oestmann, Eldon D., to Caterpillar Tractor Co. Recoil mechanism. 3,938,851, Cl. 305-10.000.

Sheridan, Arthur L.; and Marbach, Walter V., to Union Carbide Corporation. Zone regulation of casing inflation gas. 3,938,220, Cl. 17-42.000.

Sherrill, William M.: *See—*
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Shiba, Hiroshi: *See—*
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Shida, Shigeru; Yasuda, Kenichi; Awazuhara, Hiroshi; and Tsumura, Sukebumi, to Hitachi, Ltd. Shape control method and system for a rolling mill. 3,938,360, Cl. 72-8.000.

Shifrin, Gordon A., to United States of America, Navy. Two dimensional display of detector response. 3,939,347, Cl. 250-334.000.

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Shigeta, Yasuo, to Sony Corporation. Tape apparatus including means to count length-related pulses for video editing. 3,939,491, Cl. 360-14.000.

Shimizu, Atsushi: *See—*
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Shimizu, Ikuo; and Toyoshima, Masakatsu, to Sony Corporation. Radio receiver with a phase locked loop for a demodulator. 3,939,424, Cl. 325-346.000.

Shimizu, Ikuo; and Ichihara, Keiko, to Sony Corporation. Receiver with automatic pass band control. 3,939,428, Cl. 325-427.000.

Shimizu, Masami; and Koyama, Masao, to Fuji Denki Seizo Kabushiki Kaisha; and Yokohama Rubber Company Ltd., The. Method and device for classifying tires. 3,939,349, Cl. 250-360.000.

Shionogi & Co., Ltd.: *See—*
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Shirai, Shogo; and Uchida, Haruo, to Kabushiki Kaisha Akashi Seisakusho. Electron microscope specimen mounting apparatus. 3,939,353, Cl. 250-441.000.

Shiratori, Yukio: *See—*
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Shoberg, Ralph S.; and Ulicny, Thomas A., to GSE Inc. Constant moment weigh scale with floating flexure beam. 3,938,603, Cl. 177-211.000.

Showa Denko K.K.: *See—*
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Siele, Victor I.; and Gilbert, Everett E., to United States of America, Army. Process for preparing 1,3,5,7-tetranitro-1,3,5,7-tetraazacyclooctane. 3,939,148, Cl. 260-239.0HM.
Siemens Aktiengesellschaft: *See—*
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Simon, Arpad, to Atom Auto Pecas Ltd. Carburetors. 3,939,230, Cl. 261-50.00A.
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Sirieix, Michel Benoit: *See—*
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Sly, Eugene L.; and Salmans, Dean R. Slicing system with automatic portion weight control. 3,938,602, Cl. 177-116.000.
Smalley, Kenneth C.: *See—*
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Smith, Donald V. High strength bolt assembly for doors and the like. 3,938,836, Cl. 292-148.000.
Smith, Edward Peter, to BTR Industries Limited. Method and apparatus for sealing leaking pipeline joints. 3,938,774, Cl. 249-90.000.
Smith, Harry D., Jr.: *See—*
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Smith, Ian Edward; Hastwell, Peter John; and Vermeulen, Marinus Cornelus, to Savin Business Machines Corporation. Process for forming a liquid developer organisol. 3,939,085, Cl. 252-62.120.
Smith, James W., to GTE Automatic Electric Laboratories Incorporated. Muting circuit for subscribers telephone. 3,939,311, Cl. 179-81.00R.
Smith, Lyle B., to General Motors Corporation. Gearing with speed responsive starting clutches. 3,938,631, Cl. 192-3.520.
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Societe Anonyme dite: R.K.S.: *See—*
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Stranger-Johannessen, Per. Method for continuous displacement washing of liquid-containing pulp materials. 3,938,206, Cl. 8-156.000.
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Strong, Jerry G., to Mobil Oil Corporation. p-Tert-butyldiphenylalkane insecticides. 3,939,218, Cl. 260-649.0DD.
Stropkay, Edward J. Panic stoplight system for automobiles using a fluid pressure switching device. 3,939,316, Cl. 200-82.00D.
Strouth, Lennart; and Bjorkman, Claes. Apparatus for leading off air in connection with the measuring of the flow of a liquid. 3,938,539, Cl. 137-202.000.
Strumia, Franco; and Beverini, Nicola, to Consiglio Nazionale Della Ricerche. Hyperfine filter for the resonance lines of caesium and rubidium. 3,938,877, Cl. 350-148.000.
Stuart, Alexander, to Burroughs Wellcome Co. Pteridines. 3,939,160, Cl. 260-251.500.
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Sullivan, James D., to Monsanto Company. Functional fluid compositions containing substituted pyrimidines. 3,939,084, Cl. 252-47.500.
Sullivan, John W.; and Fleenor, Richard P., to Gould Inc. High energy gas discharge switching device. 3,939,379, Cl. 315-85.000.
Sullivan, Matthew A., to Sullivan Products, Inc. Housing for starter motor. 3,939,369, Cl. 310-89.000.
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Suzuki, Tadao, to Sony Corporation. Constant voltage circuit. 3,939,394, Cl. 321-18.000.

Suzuki, Tadao, to Sony Corporation. Power amplifier. 3,939,435, Cl. 330-51.000.

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Swenson, William J., to Raymond International, Inc. Apparatus and method for driving bulb piles. 3,938,595, Cl. 173-1.000.

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Tait, William H., to Dominion Foundries and Steel, Limited. Method of testing for and preventing the possibility of cracking, spalling or like defects in rolling mill rolls by determining the rate of change in hardness. 3,939,404, Cl. 324-40.000.

Taitel, Charles M.; and Ryan, Ralph L., to Compensating Tension Controls, Inc. Web butt splicer. 3,939,032, Cl. 156-505.000.

Takada, Tsutomu; Toyota, Toshio; Ogasawara, Akinobu; and Yamato, Syunsuke, to Nippon Steel Corporation. Method and apparatus for detecting shape of flat products. 3,938,382, Cl. 73-144.000.

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Takasawa, Seigo: *See—*
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Takeda, Tekeshi, to Alps Motorola Inc. Locking mechanism for control lever in magnetic tape recorder. 3,939,492, Cl. 360-61.000.

Takeda, Yoshiaki, to Nippondenso Co., Ltd. Ignition system for two-cylinder engines. 3,938,489, Cl. 123-148.0DS.

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Takeoka, So; Inaba, Hideya; and Ichiki, Masayoshi, to Hitachi Shipbuilding and Engineering Co., Ltd. Exhaust gas cleaning catalysts and method of producing same. 3,939,097, Cl. 252-464.000.

Takimoto, Hisashi, to Fuji Photo Film Co., Ltd. Device for butt splicing webs. 3,939,031, Cl. 156-505.000.

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Tamaru, Akio: *See—*
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Tanaka, Kiyonobu: *See—*
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Tate, Donald L. Method for assembling an access floor system. 3,938,295, Cl. 52-747.000.

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Taylor, John Richard, to International Business Machines Corporation. Phase locked oscillator. 3,939,438, Cl. 331-14.000.

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Tellie, Paul E. Firearm having two pivoted props. 3,938,273, Cl. 42-94.000.

Tellie, Paul E. Automatic firearms having a bolt assisted by an additional mass. 3,938,422, Cl. 89-169.000.

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Teramachi, Hiroshi. Track shaft — bed of ball bearing. 3,938,854, Cl. 308-6.00R.

Terasawa, Yoshio, to Hitachi, Ltd. Method of and device for measuring life time of carriers of semiconductor. 3,939,415, Cl. 324-158.00D.

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Thomson Shepherd and Company Limited: *See—*
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Tokyo Kokyu Rozai Co., Ltd.: *See—*
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Turner, Horace George, to Plessey Handel und Investments, A.G. Devices for the metered supply of liquid fuel to combustion engines, more particularly to aircraft gas-turbine engines. 3,938,322, Cl. 60-39.28R.
Turner, Leland D.; and Smith, Donald L., to Caterpillar Tractor Co. Method and apparatus for hydraulically suspending a vehicle seat. 3,938,770, Cl. 248-400.000.
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Tutihashi, Simpei, to Xerox Corporation. Gain photo-current enhancement method. 3,939,346, Cl. 250-330.000.
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Tuttle, Fordyce E., deceased; and by Tuttle, Eleanor Porter, executrix. Apparatus for detecting changes in a natural ocean wave pattern. 3,938,891, Cl. 356-120.000.
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Uchidoi, Masanori; and Yamada, Tateo, to Canon Kabushiki Kaisha. Slide projector controllable of its projection time. 3,938,886, Cl. 353-115.000.
Uchiyama, Hiroshi; Kakimoto, Kazunobu; Fujiwara, Yoshio; Yamagishi, Shigeru; and Hayakawa, Junshiro, to Mitsui Mining & Smelting Co., Ltd.; and Tokyo Kokyu Rozai Co., Ltd. Filter medium which permits increased amount of filtration. 3,939,079, Cl. 210-504.000.
Ude, Eduard Osvaldovich: *See—*
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Ueno, Takeo, to Daikin Kogyo Co., Ltd. Refrigerating apparatus with superheat control. 3,938,349, Cl. 62-197.000.
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Elachi, Charles. Diffused waveguiding capillary tube with distributed feedback for a gas laser. 3,939,439, Cl. 331-94.50C.
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van Basshuysen, Richard, to Audi NSU Auto Union Aktiengesellschaft. Exhaust gas detoxication system for a motor vehicle combustion engine. 3,938,329, Cl. 60-284.000.

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Van Huis, Robert L., to U. S. Industries, Inc. Animal enclosure with pressure controlled ventilation inlet and deflection means. 3,938,428, Cl. 98-1.500.

Van Lenten, Constance; Rosenthal, Robert; and Sperry, Elmer A., III, to Beckman Instruments, Inc. Conductivity cell electrode enclosure. 3,939,401, Cl. 324-30.00B.

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Wakashima, Yoshiaki; and Suzuki, Hiroshi, to Hitachi, Ltd. Method of manufacturing semiconductor device and resulting product. 3,939,488, Cl. 357-72.000.

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Wethington, Charles A.; and Littlejohn, David G., to Deering Milliken Research Corporation. Carpet machine. 3,939,030, Cl. 156-435.000.
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Wilkins, Tracy Dale; and Jimenez-Ulate, Franklin, to Virginia Polytechnic Institute Educational Foundation, Inc. Anaerobic microbe transport assembly and method of using. 3,939,044, Cl. 195-126.000.
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Williams, Richard David, to Instrumatics, Inc. Multipoint thermocouple assembly using coil springs. 3,939,012, Cl. 136-221.000.
Williams, Roger B., Jr.; and Loshbough, Richard C., to Reliance Electric Company. Zero indicator for plural scale systems. 3,939,332, Cl. 235-151.330.
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Winkler, Dietmar, to Linde Aktiengesellschaft. Sampling device for liquefied gases. 3,938,391, Cl. 73-421.50R.

Winnacker, Helmut, to Preussag Aktiengesellschaft. Apparatus for charging a hermetically sealed electrical energy source. 3,939,391, Cl. 320-2.000.

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Wise, Frederick Henry, to Independent Broadcasting Authority. Digital video modulation apparatus. 3,939,303, Cl. 178-7.100.

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Wyatt, Cyril F., to Tower Scaffolding (Bristol) Limited. Scaffolding. 3,938,290, Cl. 52-646.000.

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Zakharov, Viktor Ivanovich; Zinichev, Alexandr Alexeevich; and Melnichuk, Oleg Ulyanovich. Automobile active receiving antenna. 3,939,423, Cl. 325-312.000.

Zaleski, John F., to P. R. Mallory & Co. Inc. Lithium cell with internal automatic safety controls. 3,939,011, Cl. 136-177.000.

Zambolin, Adriano; and Defalco, Gianfranco, to Ing. C. Olivetti & C., S.p.A. Horizontal tabulation apparatus for accounting machines or the like. 3,938,644, Cl. 197-176.000.

Zaoui, Raymond. Trousers. 3,938,196, Cl. 2-227.000.

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Ziegler, Gerhard, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Power plant. 3,939,357, Cl. 290-52.000.

Zimmermann, Frederick N., to March Manufacturing Company. Pump impeller and coupling magnet structures. 3,938,914, Cl. 417-420.000.

Zimmermann, Manfred; Lehnert, Guenther; Maertens, Dieter; and Pampus, Gottfried, to Bayer Aktiengesellschaft. Polymerisation of cyclooctene. 3,939,136, Cl. 260-93.100.

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Zmoda, Barney J., to Colgate-Palmolive Company. Antifogging cleaner. 3,939,090, Cl. 252-90.000.

Zook, James K., to All Systems, Inc. Vertical reference device. 3,938,258, Cl. 33-366.000.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF FEBRUARY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Air Products and Chemicals, Inc.: *See*—
Klee, David J., Re. 28,712.

AMF Incorporated: *See*—
Montz, James R., Re. 28,716.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Ruf, Max, Re. 28,714.

Klee, David J., to Air Products and Chemicals, Inc. Parallel flow cryogenic freezer. Re. 28,712, Cl. 62-216.000.

Montz, James R., to AMF Incorporated. Apparatus for detecting a ground connection on load side of neutral conductor. Re. 28,716, Cl. 317-18.00D.

Ruf, Max, to Audi NSU Auto Union Aktiengesellschaft; and Wankel GmbH. Internal seal for rotary piston combustion engine. Re. 28,714, Cl. 418-142.000.

Sherwood Medical Industries, Inc.: *See*—
Stevens, Peter A.; and Utting, Donald W., Re. 28,713.

Stamberger, Paul. Polyurethanes, reactive solutions and methods and their production. Re. 28,715, Cl. 260-33.20R.

Stevens, Peter A.; and Utting, Donald W., to Sherwood Medical Industries, Inc. Hypodermic needle and support structure therefor. Re. 28,713, Cl. 128-221.000.

Utting, Donald W.: *See*—
Stevens, Peter A.; and Utting, Donald W., Re. 28,713.

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A/S W. Jordan Borste & Penselfabrik: *See*—
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Albright, Edward, to SATAM Industries. Gasoline pump. 238,895, 2–17–76, Cl. D52—2.

Alfred Herbert Ltd.: *See*—
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Alilbert Exploitation Societe Anonyme: *See*—
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American Optical Corp.: *See*—
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Andersson, Rune S. Tube connector. 238,876, 2–17–76, Cl. D23—43.

Appleton, Samuel A. Masonry block. 238,870, 2–17–76, Cl. D18—2.

Ayerst Organics Ltd.: *See*—
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Baumann, Gerhard, to Interhydro AG. Moisture indicating unit for hydro-culture devices. 238,860, 2–17–76, Cl. D10—56.

Bengtsson, Sigurd W. Toothpick or similar article. 238,907, 2–17–76, Cl. D86—10.

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Berry, William J. Jr., and W. J. Berry, III. Water purification tank combination. 238,875, 2–17–76, Cl. D23—3.

Berthoud: *See*—
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Berthoud, Fernand, to Berthoud. Tank for a portable sprayer. 238,874, 2–17–76, Cl. D23—2.

Borg-Warner Corp.: *See*—
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Szucs, Robert J. 238,843.
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Bradley, David E., Jr. Amusement ride vehicle. 238,888, 2–17–76, Cl. D34—5.

Braun Aktiengesellschaft: *See*—
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Britt, William J., to Morton-Norwich Products, Inc. Bottle. 238,854, 2–17–76, Cl. D9—144.

Buckler, George M.: *See*—
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Carl Mfg. Co., Ltd.: *See*—
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Cassina, Cesare, to Centro Cassina S.r.l. Armchair. 238,835, 2–17–76, Cl. D6—26.

Cassina, Cesare, to Centro Cassina S.r.l. Small table. 238,840, 2–17–76, Cl. D6—146.

Cavalieri, Michel, to Tractel S.A. Cable handling device. 238,861, 2–17–76, Cl. D12—53.

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Christie, Cornelius W., Jr., J. T. Houlihan, and G. M. Buckler, to General Electric Co. Clock radio. 238,899, 2–17–76, Cl. D56—4.

Christie, Cornelius W., Jr., to General Electric Co. Clock radio. 238,900, 2–17–76, Cl. D56—4.

Circle One, Inc.: *See*—
Colvig, Vance D. 238,903.

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Epic Metals Corp.: *See*—
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Famolare, Joseph P., Jr., to Famolare, Inc. Slipper sole. 238,832, 2–17–76, Cl. D2—320.

Finnegan, William. Nut dispenser. 238,846, 2–17–76, Cl. D7—98.

Friedrich, Albert C., to Wine Barrel Corp. of Campbell, Calif. Restaurant building structure. 238,868, 2–17–76, Cl. D13—1.

Futorian Corp.: *See*—
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Gaeke, Gottlieb C.: *See*—
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Gaskell, Colin S., and R. M. O'Brien, to Alfred Herbert Ltd. Instrument for the display of processed information. 238,859, 2–17–76, Cl. D10—46.

General Electric Co.: *See*—
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Christie, Cornelius W., Jr. 238,900.

Gillette Co., The: *See*—
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Goy, Manuel. Petri dish. 238,886, 2–17–76, Cl. D32—1.

Harkins, Guy V., to AMP Inc. Electrical connector. 238,878, 2–17–76, Cl. D26—1.

Hartwein, Peter, to Braun Aktiengesellschaft. Motion picture camera or similar article. 238,902, 2–17–76, Cl. D61—1.

Hashioka, Noriyasu, to Hope Kabushiki Kaisha. Toe fixture for a ski safety binding. 238,890, 2–17–76, Cl. D34—14.

Hayes, Thomas H., to VCA Corp. Combined actuator and dispensing cap for a pressurized container. 238,855, 2–17–76, Cl. D60.

Heck, Bennett L., and K. W. Raczynski. Motorcycle chain storage compartment. 238,865, 2–17–76, Cl. D12—158.

Helfand, Bernard B., deceased; by Phyllis Jones Neidig Helfand. Folding flight training hood. 238,831, 2–17–76, Cl. D2—234.

Helfand, Phyllis J. N.: *See*—
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Joly, Henriette. Direction indicator for vehicles, specially for cycles and motor-cycles. 238,894, 2–17–76, Cl. D48—32.
Jones, Terry H. Carpet cleaning apparatus. 238,849, 2–17–76, Cl. D7—165.
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Maddestra, Robert, and D. E. Munn, to Damon Corp. Alcohol burner and cap therefor. 238,877, 2–17–76, Cl. D23—72.
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Robert, Tony. Holder for a food bowl for pets. 238,885, 2–17–76, Cl. D30—13.
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West, Emery L. Fishing lure holder. 238,873, 2–17–76, Cl. D22—99.
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CLASSIFICATION OF PATENTS

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93	3,938,985
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221	3,939,012

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CLASS 175
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99 3,938,598
329 3,938,599
422 3,938,600

CLASS 176
38 3,939,038
87 3,939,039

CLASS 177
1 3,938,601
116 3,938,602
211 3,938,603

CLASS 178
6.6R 3,939,302
7.1 3,939,303
68 3,939,304

CLASS 179
1J 3,939,305
2TV 3,939,306
15A 3,939,307
17A 3,939,308
18ES 3,939,309
81R 3,939,311
115.5PV 3,939,312
156R 3,939,310

CLASS 180
6.44 3,938,604
9.44 3,938,607
9.5 3,938,605
3,938,606
21 3,938,608
27 3,938,609
69C 3,938,610
77R 3,938,611
82R 3,938,612
99 3,938,613

CLASS 181
129 3,938,614
131 3,938,615
136 3,938,616
155 3,938,617
3,938,618

CLASS 182
113 3,938,619
135 3,938,620

CLASS 184
1.5 3,938,621
15R 3,938,622
38R 3,938,623

CLASS 187
29R 3,938,624

CLASS 188
1B 3,938,625
3,938,626
1C 3,938,627
18A 3,938,628
62 3,938,629

CLASS 190
24 3,938,630

CLASS 192
3.52 3,938,631
41A 3,938,632
48.3 3,938,633
56F 3,938,634
106.2 3,938,635
111A 3,938,636
113R 3,938,637

CLASS 194
4C 3,938,638
87 3,938,639
92 3,938,640

CLASS 195
6 3,939,040
31F 3,939,041
49 3,939,042
80R 3,939,043
126 3,939,044

CLASS 197
1R 3,938,641
98 3,938,642
176 3,938,644

CLASS 198
19 3,938,643
20R 3,938,645
31AA 3,938,647
31R 3,938,646
34 3,938,648
38 3,938,649
76 3,938,650
136 3,938,651
223 3,938,652
283 3,938,653
287 3,938,654

CLASS 200
11J 3,939,313
61.42 3,939,314
61.64 3,939,315
82D 3,939,316
148A 3,939,317
159R 3,939,318

CLASS 203
1 3,939,045

CLASS 204
4 3,939,046
15 3,939,047
157.1H 3,939,048
159.13 3,939,049
162HE 3,939,050
181 3,939,051
192 3,939,052
212 3,939,053
213 3,939,054
295 3,939,055
297W 3,939,056

CLASS 206
5 3,938,655
150 3,938,656
343 3,938,657
439 3,938,658
3,938,659
451 3,938,660
523 3,938,661

CLASS 208
11 3,939,057
120 3,939,058
139 3,939,059
3,939,060
140 3,939,061
3,939,062

CLASS 209
7 3,939,063
44 3,939,064
73 3,938,662
3,938,663
233 3,938,664
240 3,939,065

CLASS 210
6 3,939,066
7 3,939,067
3,939,068
22A 3,939,069
23H 3,939,070
34 3,939,071
96R 3,939,072
152 3,939,073
257M 3,939,074
258 3,939,075
400 3,939,076
401 3,939,077
436 3,939,078
504 3,939,079

CLASS 211
4 3,938,665
49D 3,938,666
87 3,938,667
134 3,938,668

CLASS 212
8B 3,938,669
46A 3,938,670

CLASS 214
1BD 3,938,672
1R 3,938,671
2 3,938,673
6G 3,938,674
6M 3,938,675
13 3,938,676
17CB 3,938,677
38D 3,938,678
83.3 3,938,679
145R 3,938,680
147G 3,938,681
353 3,938,682
519 3,938,683
521 3,938,684
621 3,938,685

CLASS 215
232 3,938,686

CLASS 219
10.55B 3,939,319
10.55F 3,939,320
69D 3,939,321
69R 3,939,322
121LM 3,939,323
126 3,939,324
216 3,939,325
3,939,326

CLASS 220
5R 3,938,687
23.8 3,938,688
71 3,938,689
77 3,938,694
90.4 3,938,690
3,938,695
94A 3,938,691
203 3,938,692
267 3,938,693
273 3,938,696

CLASS 221
11 3,938,697
73 3,938,698
85 3,938,699
109 3,938,700
184 3,938,701
238 3,938,702
305 3,938,703

CLASS 222
5 3,938,704
59 3,938,705
83.5 3,938,706
3,938,707
95 3,938,708
102 3,938,709
153 3,938,474
209 3,938,710
404 3,938,711
486 3,938,712
525 3,938,713
534 3,938,714
3,938,715

CLASS 224
5R 3,938,720
9 3,938,716
13 3,938,717
25A 3,938,718
36 3,938,719

CLASS 226
75 3,938,721

CLASS 228
1 3,938,722
117 3,938,723
147 3,938,724
155 3,938,725

CLASS 229
2.5R 3,938,726
3,938,727
14B 3,938,728
30 3,938,729
43 3,938,730
54R 3,938,731

CLASS 232
16 3,938,733

CLASS 233
20R 3,938,734
26 3,938,735

CLASS 235
61.11E 3,939,327
94R 3,938,736
131R 3,938,737
150.1 3,939,328
151.1 3,939,329
151.11 3,939,330
151.32 3,939,331
151.33 3,939,332
153AP 3,939,333
156 3,939,334
3,939,335
184 3,939,336

CLASS 239
9 3,938,738
15 3,938,739
3,938,740
75 3,938,741
265.11 3,938,742
457 3,938,743

CLASS 240
8.3 3,939,337
10P 3,939,338
62.2 3,939,339
103R 3,939,340

CLASS 241
46.11 3,938,744
99 3,938,745
186R 3,938,746
231 3,938,732

CLASS 242
4C 3,938,747
7.09 3,938,748
18PW 3,938,749
36 3,938,750
47.01 3,938,751
55.19A 3,938,752
71.2 3,938,753
107.4A 3,938,754
3,938,755
186 3,938,757
188 3,938,756
201 3,938,758

CLASS 244
9 3,938,759
12D 3,938,760
13 3,938,761
17.13 3,938,762
110C 3,938,763
117R 3,938,764

CLASS 246
172 3,938,765

CLASS 248
23 3,938,766
58 3,938,767
129 3,938,768
312 3,938,769
400 3,938,770
429 3,938,771
461 3,938,772

CLASS 249
27 3,938,773
90 3,938,774
102 3,938,775
114 3,938,776

CLASS 250
199 3,939,341
203R 3,939,342
262 3,939,343
281 3,939,344
315A 3,939,345
330 3,939,346
334 3,939,347
339 3,939,348
360 3,939,349
365 3,939,350
402 3,939,351
409 3,939,352
441 3,939,353
484 3,939,354
497 3,939,355

CLASS 251
82 3,938,777
129 3,938,778
268 3,938,779

CLASS 252
1 3,939,080
12 3,939,081
32.7E 3,939,082
42 3,939,083
47.5 3,939,084
62.1L 3,939,085
3,939,087
62.1P 3,939,086
79HF 3,939,088
79.4 3,939,089
90 3,939,090
189 3,939,091
301.2C 3,939,094
301.2P 3,939,092
301.2R 3,939,093
316 3,939,095
408R 3,939,101
439 3,939,102
455R 3,939,103
3,939,104
456 3,939,096
464 3,939,097
518 3,939,098
522 3,939,099
532 3,939,100

CLASS 254
126 3,938,780
175.7 3,938,781

CLASS 259
4R 3,938,782
7 3,938,783
8 3,938,784
149 3,938,785
151 3,938,786
177R 3,938,787

CLASS 260
2.5AM 3,939,106
2.5AY 3,939,105
17.3 3,939,107
17.4ST 3,939,108
29.1R 3,939,109
29.6ME 3,939,110
32.6NR 3,939,111
33.2R Re.28,715
33.6AQ 3,939,112
40P 3,939,113
42.14 3,939,114
45.8N 3,939,115
47CB 3,939,116
47XA 3,939,118
47C 3,939,117
49 3,939,119
63HA 3,939,120
65 3,939,130
70A 3,939,121
77.5AM 3,939,123
77.5AT 3,939,124
77.5CR 3,939,126
77.5C 3,939,125
77.5R 3,939,122
78.4D 3,939,127
79.5P 3,939,128
79.7 3,939,129
80.7 3,939,131
80.72 3,939,132
85.1 3,939,133
85.5R 3,939,134
87.1 3,939,135
93.1 3,939,136
94.9C 3,939,137
100 3,939,138
112.5R 3,939,139
145A 3,939,140
151 3,939,141
205 3,939,142
210E 3,939,144
210K 3,939,143
210R 3,939,145
3,939,146
239BC 3,939,147
239HM 3,939,148
239.1 3,939,149
3,939,150
3,939,180
239.3A 3,939,153
239.3B 3,939,152
239.55R 3,939,155
239.57 3,939,156
239.9 3,939,154
243C 3,939,151
3,939,157
249.5 3,939,158
250Q 3,939,159
251.5 3,939,160
256.4F 3,939,161
256.4Q 3,939,162
270C 3,939,163
286R 3,939,164
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293.6 3,939,166
293.67 3,939,167
293.77 3,939,168
294.8D 3,939,171
294.8F 3,939,170
294.8R 3,939,169
306.8R 3,939,172
308A 3,939,174
308D 3,939,173
309.5 3,939,175
310A 3,939,176
315 3,939,177
326.28 3,939,178
332.8 3,939,179
340.7 3,939,181
343.3R 3,939,182
346.8M 3,939,183
349 3,939,184
369 3,939,185
397.4 3,939,186
397.45 3,939,187
429R 3,939,188
429.9 3,939,189
439R 3,939,194
446 3,939,190
448.2E 3,939,195
449.5 3,939,191
453R 3,939,192
457 3,939,193
458 3,939,197
469 3,939,198
3,939,199
482R 3,939,200
488J 3,939,201
489 3,939,202
518A 3,939,204
561N 3,939,205
566A 3,939,203
601R 3,939,206
3,939,207
604AC 3,939,209
604R 3,939,208
609F 3,939,210
610B 3,939,211
611R 3,939,212
613R 3,939,196
615B 3,939,213
621G 3,939,214
624A 3,939,215
635P 3,939,216
643D 3,939,217
649DD 3,939,218
666P 3,939,219
668D 3,939,220
674SA 3,939,221
858 3,939,222
876R 3,939,223
880B 3,939,224
880R 3,939,225
932 3,939,226
953 3,939,227
973 3,939,228
985 3,939,229

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62 3,939,231
72R 3,939,232

CLASS 264
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31 3,939,234
46.6 3,939,235
53 3,939,236
54 3,939,237
71 3,939,238
89 3,939,239
91 3,939,240
111 3,939,241
294 3,939,242
296 3,939,243

CLASS 266
13 3,938,788
16 3,938,789
35 3,938,790
42 3,938,791

CLASS 267
69 3,938,792
120 3,938,793
130 3,938,794
140 3,938,795

CLASS 269
2 3,938,796
20 3,938,797
3,938,798

CLASS 270
55 3,938,799
CLASS 271
93 3,938,800
173 3,938,801
220 3,938,802
CLASS 272
57J 3,938,803
CLASS 273
25 3,938,804
32A 3,938,805
95R 3,938,806
110 3,938,807
131BA 3,938,808
176FA 3,938,809
CLASS 274
13R 3,938,810
CLASS 277
15 3,938,811
41 3,938,812
152 3,938,813
235A 3,938,814
CLASS 279
1C 3,938,815
5 3,938,816
61 3,938,817
CLASS 280
19 3,938,818
3,938,819
47.11 3,938,820
87C 3,938,821
95R 3,938,822
124F 3,938,823
150AB 3,938,824
3,938,826
150B 3,938,825
209 3,938,827
261 3,938,828
414R 3,938,829
493 3,938,830
CLASS 281
29 3,938,831
CLASS 285
157 3,938,832
166 3,938,833
235 3,938,834
CLASS 290
52 3,939,356
3,939,357
CLASS 291
34 3,938,835
CLASS 292
148 3,938,836
149 3,938,837
210 3,938,838
258 3,938,839
CLASS 293
71P 3,938,840
71R 3,938,841
3,938,842
CLASS 294
54 3,938,843
83R 3,938,844
86A 3,938,845
106 3,938,846
110R 3,938,847
CLASS 296
154 3,938,856

CLASS 297
263 3,938,857
284 3,938,858
385 3,938,859
440 3,938,860
CLASS 298
27 3,938,861
CLASS 302
42 3,938,848
CLASS 303
21A 3,938,849
24F 3,938,850
CLASS 305
10 3,938,851
CLASS 307
22 3,939,358
66 3,939,359
118 3,939,360
141 3,939,361
150 3,939,362
202R 3,939,363
221C 3,939,364
235A 3,939,365
CLASS 308
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4A 3,938,853
6R 3,938,854
3,938,855
9 3,938,862
3,938,863
187.2 3,938,864
205 3,938,865
235 3,938,866
3,938,867
239 3,938,868
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3R 3,939,366
20 3,939,367
59 3,939,368
89 3,939,369
125 3,939,370
154 3,939,371
168 3,939,372
3,939,373
CLASS 312
100 3,938,869
184 3,938,870
240 3,938,871
291 3,938,872
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95 3,939,374
408 3,939,375
451 3,939,376
468 3,939,377
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12R 3,939,378
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397 3,939,380
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101R 3,939,381
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141S 3,939,384
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262A 3,939,386
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227 3,939,387
321 3,939,388

578 3,939,389
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CLASS 320
2 3,939,391
CLASS 321
11 3,939,392
15 3,939,393
18 3,939,394
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4 3,939,395
8 3,939,396
22T 3,939,399
CLASS 324
16T 3,939,397
21 3,939,398
29.5 3,939,400
30B 3,939,401
3,939,408
34R 3,939,402
40 3,939,403
3,939,404
57R 3,939,405
58.5C 3,939,406
71CP 3,939,409
72 3,939,410
77H 3,939,411
96 3,939,412
142 3,939,413
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158F 3,939,414
174 3,939,416
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16 3,939,418
33 3,939,419
47 3,939,407
67 3,939,420
133 3,939,421
163 3,939,422
312 3,939,423
346 3,939,424
348 3,939,425
363 3,939,426
418 3,939,427
427 3,939,428
432 3,939,429
446 3,939,430
478 3,939,431
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13 3,939,432
CLASS 330
25 3,939,433
40 3,939,434
51 3,939,435
84 3,939,436
3,939,437
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14 3,939,438
94.5C 3,939,439
CLASS 333
70CR 3,939,440
70R 3,939,441
72 3,939,442
73R 3,939,443
79 3,939,444
98TN 3,939,445
98R 3,939,446
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210 3,939,447

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CLASS 336
60 3,939,449
90 3,939,450
CLASS 338
128 3,939,451
CLASS 339
58 3,938,873
59M 3,938,874
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3E 3,939,462
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3R 3,939,461
4R 3,939,464
5R 3,939,465
7R 3,939,466
7 3,939,468
8R 3,939,467
10 3,939,469
59 3,939,470
3,939,471
146.1R 3,939,472
3,939,473
172.5 3,939,452
3,939,453
3,939,455
173PL 3,939,454
213R 3,939,456
239F 3,939,457
324A 3,939,458
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408 3,939,460
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112R 3,939,476
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721 3,939,478
753 3,939,479
761 3,939,480
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128 3,938,876
148 3,938,877
150 3,938,878
160LC 3,938,879
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161 3,938,881
214 3,938,882
3,938,883
215 3,938,884
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78R 3,938,885
CLASS 353
115 3,938,886
CLASS 354
83 3,939,483
187 3,939,484
CLASS 355
63 3,938,887
CLASS 356
87 3,938,888
109 3,938,889
119 3,938,890
120 3,938,891
124 3,938,892

125 3,938,893
3,938,894
152 3,938,895
179 3,938,896
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CLASS 358
4 3,939,485
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81 3,939,487
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13 3,939,489
14 3,939,490
3,939,491
61 3,939,492
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103 3,939,495
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155 3,938,897
183 3,938,898
260 3,938,899
CLASS 403
263 3,938,900
350 3,938,901
391 3,938,902
CLASS 404
16 3,938,903
35 3,938,904
CLASS 415
119 3,938,905
139 3,938,906
141 3,938,907
196 3,938,908
CLASS 417
12 3,938,909
3,938,910
252 3,938,911
339 3,938,912
356 3,938,913
420 3,938,914
CLASS 418
9 3,938,915
137 3,938,916
142 Re.28,714
3,938,917
150 3,938,918
183 3,938,919
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76 3,939,244
118 3,939,246
135 3,939,247
166 3,939,248
178 3,939,249
224 3,939,250
244 3,939,251
263 3,939,252
312 3,939,254
313 3,939,255
578A 3,939,256
658 3,939,257
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28 3,939,260
49 3,939,261
52 3,939,262
216 3,939,263

239 3,939,264
3,939,265
246 3,939,266
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258 3,939,269
271 3,939,270
273 3,939,271
276 3,939,272
282 3,939,273
308 3,939,274
309 3,939,253
310 3,939,275
317 3,939,276
319 3,939,267
340 3,939,277
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111 3,938,921
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147 3,938,924
198 3,938,925
233 3,938,926
373 3,938,927
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501 3,938,929
505 3,938,931
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250 3,939,283
3,939,284
285 3,939,285
312 3,939,286
316 3,939,287
332 3,939,288
548 3,939,289
564 3,939,290
594 3,939,291
603 3,939,282
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55 3,939,292
403 3,939,293
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424 3,939,294
539 3,939,295
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4 3,938,933
11 3,938,934
47 3,938,935
51 3,938,936
78 3,938,937
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